Murdoch Childrens Research Institute

Healthier Kids. Healthier Future.

User Guide

File	REDCap_User_Guide_3.00_2013-04-10.docx
Author	Luke Stevens
REDCap Version	5.2

Contents

Contents 1

1 REDCap: Research Electronic Data Capture 5

1.1 About the REDCap System 5

1.2 REDCap at Murdoch Childrens 5

1.3 Feature summary 6

1.4 Accessing REDCap 7

1.4.1 Login URL 7

1.4.2 User Accounts 7

1.4.3 Passwords 7

1.4.4 Access to Individual REDCap Projects 8

1.5 Home screen 9

1.5.1 Log out 9

1.5.2 My Profile 9

1.5.3 Send-It 9

1.5.4 Help & FAQ 10

1.5.5 Training Resources 10

1.5.6 My Projects 11

2 A REDCap Project 12

2.1 Create New Project 12

2.2 Project Screen 13

2.3 Project Lifecycle 14

2.3.1 Project Status 14

2.3.2 Project Status Transitions 14

2.4 Project Setup (Development) 15

2.4.1 Navigation 15

2.4.2 Work Flow 15

2.4.3 Main project settings 16

2.4.4 Design your data collection instruments 16

2.4.5 Online Designer 17

2.4.6 Online Designer: Make Changes to a Data Collection Form 19

2.4.7 Online Designer: Survey-related Options 24

2.4.8 Data Dictionary 27

2.4.9 Online Designer / Data Dictionary Equivalence 29

2.4.10 Define your events and designate instruments for them (Longitudinal only) 30

2.4.11 Enable optional modules and customizations 32

2.4.12 Set up project bookmarks (optional) 34

2.4.13 User Rights and Permissions 35

2.4.14 Move your project to production status 36
2.5 In Production 37
2.5.1 Differences from Development 37
2.5.2 Making Changes to a Production Project 37
2.5.3 Project Revision History 42
2.6 Other Functionality 43
3 Data Entry 44
3.1 Data Entry Navigation 44
3.1.1 Data Entry Navigation: Survey 44
3.1.2 Data Entry Navigation: Data Entry Forms (Non-Longitudinal) 44
3.1.3 Data Entry Navigation: Data Entry Forms (Longitudinal) 44
3.2 Record Operations 45
3.2.1 "Record Identifier" Defined 45
3.2.2 Creating a New Record 45
3.2.3 Creating a New Record: Arms 47
3.2.4 Select Existing Record 48
3.2.5 Rename a Record 49
3.2.6 Delete Records 49
3.3 Record Status Dashboard 50
3.4 Survey Invitations: Invite Participants 51
3.4.1 Public Survey Link 51
3.4.2 Participant List 51
3.4.3 Pre-Populating Survey Fields 54
3.5 Navigation (Within Record) 55
3.6 Form Data Entry 57
3.7 Survey Data Entry 59
3.8 Scheduling 61
3.9 Double Data Entry 63
3.10 Deleting Test Data 63
4 Applications 64
4.1 Calendar 64
4.1.1 Calendar Events 64
4.1.2 Scheduling Report 65
4.2 Data Export 66
4.2.1 Export Type 66
4.2.2 Advanced Export 66
4.2.3 De-Identification 66
4.2.4 Export Formats 66
4.2.5 Export of Checkbox Fields 68

4.2.6 Data Model for Longitudinal Projects 68
4.3 Data Import 69
4.3.1 Import Template 69
4.3.2 Importing to Checkbox Fields 69
4.3.3 Importing to Date and DateTime Fields 69
4.3.4 Upload File 69
4.3.5 Upload Summary 69
4.3.6 Importing Data for Longitudinal Projects 70
4.3.7 Importing Data for Data Access Groups 70
4.4 Data Comparison Tool 71
4.5 Logging 72
4.6 File Repository 73
4.6.1 User Files 73
4.6.2 Data Export Files 73
4.6.3 Upload New File 73
4.7 User Rights 74
4.7.1 Creating Users 74
4.7.2 Add a New Project User 74
4.7.3 Edit User Permissions 74
4.7.4 Data Access Groups 75
4.8 Record Locking Customisation 77
4.9 E-Signature and Locking Management 77
4.10 Graphical Data View & Stats 78
4.11 Data Quality 79
4.11.1 Execute Rules 79
4.11.2 Discrepancies 79
4.11.3 Add a New Rule 80
4.12 API 80
4.13 Report Builder 81
4.13.1 Create a New Report 81
4.13.2 Manage Reports 81
4.13.3 Reports in Longitudinal Projects 82
5 Project Design 83
5.1 Form Design Considerations 83
5.2 Testing 84
5.2.1 General instructions 84
5.2.2 Specific instructions 84
5.2.3 Testing Changes to Projects in Production 84
5.3 Handling Missing Values 85

5.3.1 Suggested Approach for Handling of Missing Data 85
5.4 Calculated Fields 86
5.4.1 What Calculated Fields Are – and Are Not – For 86
5.4.2 Calculation Expressions 86
5.5 Branching Logic 86
5.6 Styling with HTML and CSS 87
6 Further Considerations 88
6.1 Data Model 88
6.2 Use Cases 89
6.2.1 Modelling 1:n Relationships for Small n: Wide Dataset 89
6.2.2 Modelling 1:n Relationships for Large n: Linked Projects 89
6.2.3 Data Query Tracking 89
6.2.4 Operational Support: Tracking Project Milestones 89
6.2.5 Multi-Arm Setup for Enrolment and Randomised Phases 89
6.2.6 Contact Details/Project Enquiry Form Embedded in Webpage 89
6.3 Advanced Features 89
6.4 Alternatives to REDCap 90
6.5 More Help 91
6.5.1 This Guide 91
6.5.2 REDCap System Administrator 91
6.5.3 Training 91

1 REDCap: Research Electronic Data Capture

1.1 About the REDCap System

REDCap is a secure, web-based application for building and managing online surveys and databases.

The REDCap application is developed at Vanderbilt University, and software and support are available at no charge to institutional partners: members of the REDCap Consortium.

More information, including up-to-date statistics on the use of REDCap across the Consortium, can be found on the project's website: http://www.project-redcap.org/.

Development of the system is very active. The development team currently aim to make minor releases – containing bug fixes and minor improvements – on a weekly basis, with releases of new functionality every month.

1.2 REDCap at Murdoch Childrens

Murdoch Childrens has been a member of the REDCap Consortium since August 2010. At April 2013 the system contains 80000 records across 260 projects, with 250 active users. These numbers have roughly doubled since June 1012.

The REDCap application (database and web server) are hosted at Murdoch Childrens, which means that all data is secure within MCRI's IT infrastructure, and that the system is an appropriate repository for research data.

Use of the REDCap system is governed by an End User Licence Agreement between Murdoch Childrens and Vanderbilt University. This agreement enables all Murdoch Childrens researchers to utilise the system for their research activities **free of charge**.

The only stipulation is that use of REDCap should be cited in any publications or presentations arising from research projects that make use of the application. See http://www.project-redcap.org/cite.php for suitable boilerplate text.

1.3 Feature summary

REDCap has been developed specifically as a tool that researchers can set up and use themselves, and therefore contains a feature set that aligns well with the needs of many research projects.

Build online surveys and databases quickly and securely
Create and design your project rapidly using secure web authentication from your browser. No extra software is required.

Export data to common data analysis packages
Export your data to Microsoft Excel, PDF, SAS, Stata, R, or SPSS for analysis.

Scheduling
Utilize a built-in project calendar and scheduling module for organizing your events and appointments.

Send files to others securely
Using 'Send-It', upload and send files to multiple recipients, including existing project documents, that are too large for email attachments or that contain sensitive data.

Advanced form features
Auto-validation, calculated fields, file uploading, branching/skip logic, and survey stop actions.

Fast and flexible
Conception to production-level survey/database in less than one day.

Ad Hoc Reporting
Create custom queries for generating reports to view or download.

Contact list of survey respondents
Build a list of email contacts, create custom email invitations, and track who responds.

Save your data collection instruments as a PDF to print
Generate a PDF version of your forms and surveys for printing to collect data offline.

REDCap API
Have external applications connect to REDCap remotely in a programmatic or automated fashion.

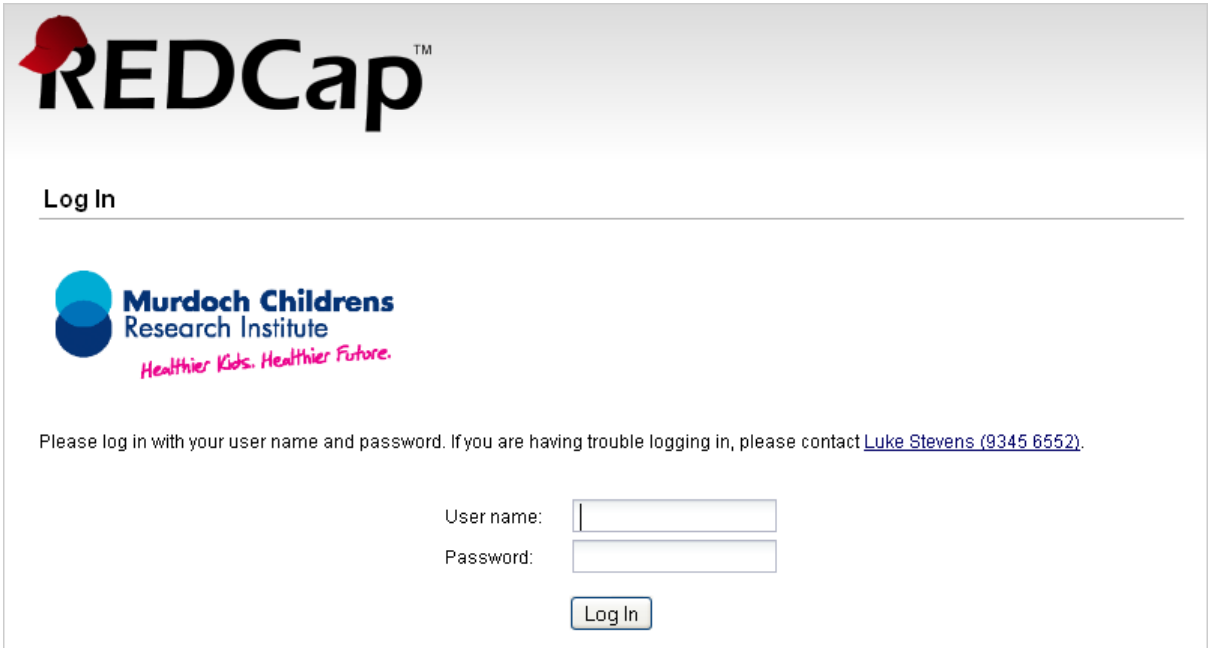
1.4 Accessing REDCap

1.4.1 Login URL

Go to this URL in your browser: https://redcap.mcri.edu.au/

Which browser?

Good	Firefox, Chrome, Opera, Safari, IE8+
OK, but slow	Internet Explorer 6 / 7


REDCap
Log In
Murdoch Childrens Research Institute
Healthier Kids. Healthier Future.
Please log in with your user name and password. If you are having trouble logging in, please contact Luke Stevens (9345 6552).
User name:
Password:
Log In

1.4.2 User Accounts

Access to the REDCap application is controlled via individual user accounts created by the REDCap System Administrator. Accounts can be created for anybody – for RCH staff and external collaborators, as well as for Murdoch Childrens staff – but note that the ability to create new projects is restricted to users that hold a Murdoch Childrens appointment.

1.4.3 Passwords

When your account is created you will receive an email containing login details: URL, username and a temporary password. You will be required to set your own password when you log in for the first time.

REDCap passwords must meet the following criteria:

- Length between 10 and 15 characters
- Comprised of only letters, numbers, and underscores
- Contains at least one lower-case letter, one upper-case letter, and one number

You will also be asked to set a challenge question and answer that can be used to assist you should you forget your password. If all else fails contact the REDCap administrator to obtain a new temporary password.

Do not write down your password. Your login details should be kept private and not be shared.

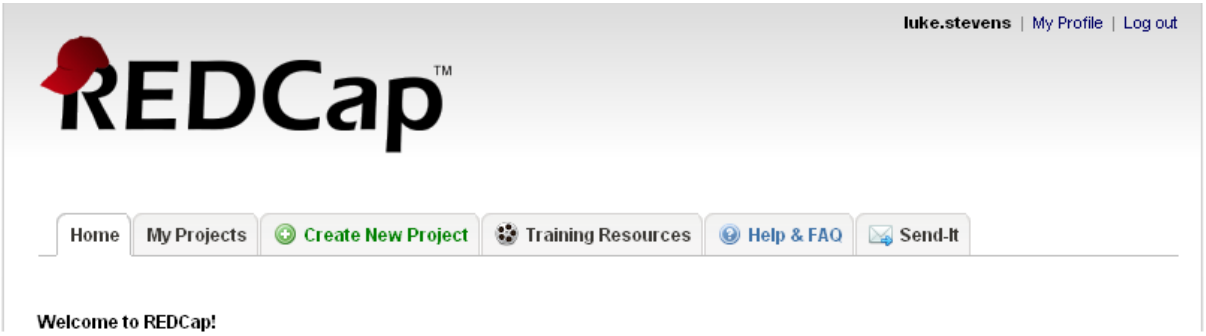
1.4.4 Access to Individual REDCap Projects

Access to individual projects is coordinated by the project owner (i.e. the user that created the project) via the project's User Rights module. The project owner may delegate this task to other users by granting them permission to access the User Rights module.

Do not ask the REDCap administrator to grant a user access to your project.

1.5 Home screen

The **Home screen** is the front page of the application: the first page you will see when you log in.



Note the following features...

1.5.1 Log out

As with any web-based application it is recommended that you always log out using the **Log out** button after completing your tasks.

Your session will time out after 60 minutes of inactivity, requiring you to log in again to continue.

1.5.2 My Profile

Go to **My Profile** to change your name, email address or password.

You can add additional email addresses to your REDCap account that you can use when, for example, sending survey invitations. A verification process is enforced to ensure that you have access to all of the email accounts you enter.

1.5.3 Send-It

Send-It is a secure data transfer application that allows you to upload a file (up to 64 MB in size) and then allow multiple recipients to download the file in a secure manner.

Using Send-It enables you to send files that are too large for email attachments or that contain sensitive data that preclude the use of applications that store (unencrypted) files on an external server (e.g. aarnet's CloudStor, https://cloudstor.aarnet.edu.au/filesender/, or Dropbox).

Using Send-It

1. Complete and submit the form, specifying recipients' email addresses, message subject and body text, the file to upload and an expiry period

2. The file will be uploaded to the REDCap server. The data is therefore maintained entirely within MCRI until it is downloaded by the intended recipient(s).

3. Each recipient will receive an email containing a unique download URL, along with a follow-up email containing a password required for downloading the file.

4. The file will be removed from the server after the specified expiration period has elapsed.

1.5.4 Help & FAQ

The **Help & FAQ** page contains a number of questions and answers relevant to general use of the system. Make it your first point of reference if you get stuck, particularly for help with branching logic or calculated field expressions.

1.5.5 Training Resources

Vanderbilt provides several training videos and example projects that you can access freely from the **Training Resources** page.

Video Streaming Performance

Due to the bandwidth limitations of the local network's connection to the internet, there can be some problems with intermittent pausing of video playback. To mitigate this, use the "alternative viewing method" option available via a link below the video player:

If the video above will not load, try the alternate viewing method.

This option enables you to pause the playback and allow the video to continue buffering.

Click play to resume the video once it has buffered sufficiently for playback to reach the end without stopping. (You can only guess at how long this is, but the point is that you do not need to wait until the video has buffered right to the end before resuming playback.)

1.5.6 My Projects

The **My Projects** page gives a listing of all the REDCap projects to which you have access.

Access a project by clicking the appropriate name link.

My Projects	Records	Fields	Type	Status
FaHCSIA Data Manager: Approvals	32	18		
FaHCSIA Data Manager: Datasets	1	29		
FaHCSIA Data Manager: Users	26	10		
Luke's Sandbox	9	133		
Luke's Sandbox Scheduling	6	14		
Luke's Survey Sandbox	19	10		
OPTIMIST Query Tracking	0	25		
VicCHILD: Data Access Requests	0	8		
VicCHILD: Data Repository	6	156		
VicCHILD: Recruitment and Tracking	198	159		

Note the indication of the projects' type and status in the right-hand columns.

Project Type

See Create New Project for more information on the three project types:

1. Survey
2. Data entry forms
3. Survey + data entry forms

Project Status

See Project Lifecycle for more information on the four project statuses:

1. Development: project design, setup and testing
2. Production: active phase of the project, collecting real data
3. Inactive: project closed to new records
4. Archived: project no longer required in the **My Projects** list

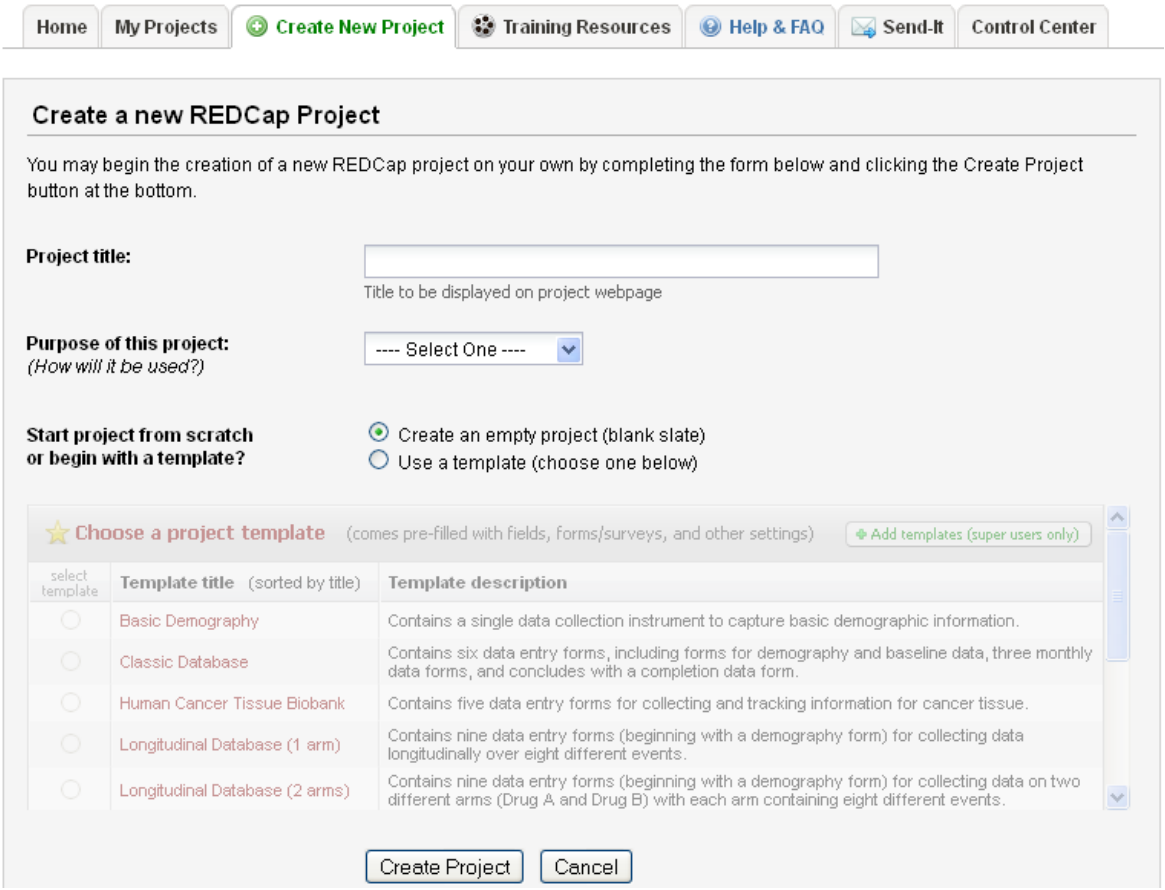
Archived projects can be viewed (and reactivated, see Other Functionality) by including them in the **My Projects** list. To do this, select the **Show Archived Projects** option at the bottom of the page.

Show Archived Projects

2 A REDCap Project

You can think of a REDCap project as being analogous to a project database file from Microsoft Access: the terms “project” and “database” are essentially synonymous, but see Linked Projects for how REDCap projects can be linked together to model more complex study domains: specifically, one-to-many relationships.

2.1 Create New Project


Home
My Projects
Create New Project
Training Resources
Help & FAQ
Send-It
Control Center
Create a new REDCap Project
You may begin the creation of a new REDCap project on your own by completing the form below and clicking the Create Project button at the bottom.
Project title:
Title to be displayed on project webpage
Purpose of this project:
(How will it be used?)
---- Select One ----
Start project from scratch or begin with a template?
Create an empty project (blank slate)
Use a template (choose one below)
Choose a project template
(comes pre-filled with fields, forms/surveys, and other settings)
Add templates (super users only)
select template
Template title (sorted by title)
Template description
Basic Demography
Contains a single data collection instrument to capture basic demographic information.
Classic Database
Contains six data entry forms, including forms for demography and baseline data, three monthly data forms, and concludes with a completion data form.
Human Cancer Tissue Biobank
Contains five data entry forms for collecting and tracking information for cancer tissue.
Longitudinal Database (1 arm)
Contains nine data entry forms (beginning with a demography form) for collecting data longitudinally over eight different events.
Longitudinal Database (2 arms)
Contains nine data entry forms (beginning with a demography form) for collecting data on two different arms (Drug A and Drug B) with each arm containing eight different events.
Create Project
Cancel

Creating a new project is as simple as selecting **Create New Project** and completing the form with the relevant details. All of the settings specified here can be altered later from the **Project Setup** page. See Project Setup.

Title

The project’s title: displayed in the **My Projects** list and in the page header of project pages.

Purpose of this project

Indicate the purpose of the project. Note that “Research” is not the only option! REDCap can be used to support other activities such as query tracking and research group administration. See Use Cases.

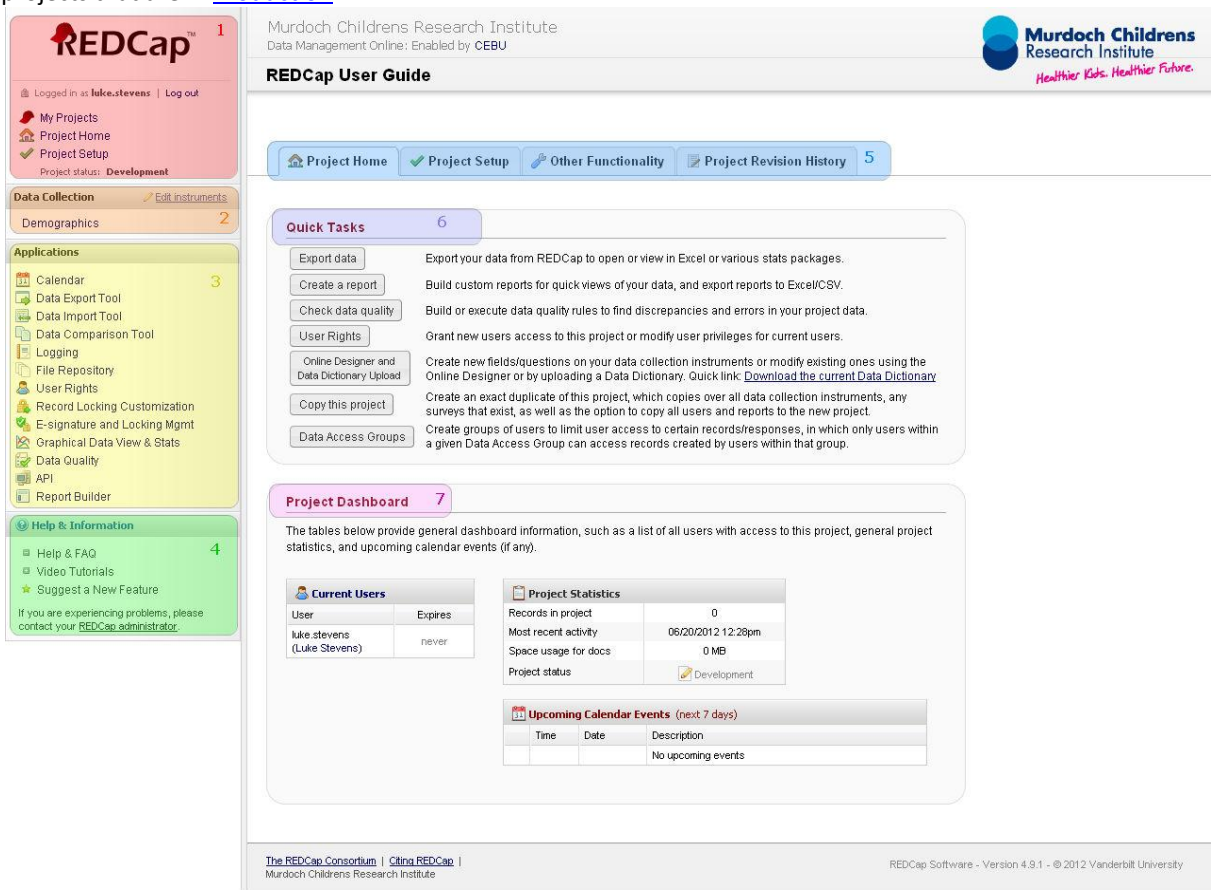
Start project from scratch or begin with a template

Pretty much self-explanatory:

- Create an empty project: creates a project with nothing yet configured and no data entry forms
- Use a template: a project will be created by copying configuration settings and data entry forms from the template project that you select from the list

2.2 Project Screen

The image below highlights the sections of the Project Home screen. This screen is the default page for projects that are in Production.


REDCap
1
Logged in as luke.stevens | Log out
My Projects
Project Home
Project Setup
Project status: Development
Data Collection
Edit instruments
Demographics
2
Applications
Calendar
3
Data Export Tool
Data Import Tool
Data Comparison Tool
Logging
File Repository
User Rights
Record Locking Customization
E-signature and Locking Mgmt
Graphical Data View & Stats
Data Quality
API
Report Builder
Help & Information
Help & FAQ
4
Video Tutorials
Suggest a New Feature
If you are experiencing problems, please contact your REDCap administrator.
Murdoch Childrens Research Institute
Data Management Online: Enabled by CEBU
REDCap User Guide
Project Home
Project Setup
Other Functionality
Project Revision History
5
Quick Tasks
6
Export data
Export your data from REDCap to open or view in Excel or various stats packages.
Create a report
Build custom reports for quick views of your data, and export reports to Excel/CSV.
Check data quality
Build or execute data quality rules to find discrepancies and errors in your project data.
User Rights
Grant new users access to this project or modify user privileges for current users.
Online Designer and Data Dictionary Upload
Create new fields/questions on your data collection instruments or modify existing ones using the Online Designer or by uploading a Data Dictionary. Quick link: Download the current Data Dictionary
Copy this project
Create an exact duplicate of this project, which copies over all data collection instruments, any surveys that exist, as well as the option to copy all users and reports to the new project.
Data Access Groups
Create groups of users to limit user access to certain records/responses, in which only users within a given Data Access Group can access records created by users within that group.
Project Dashboard
7
The tables below provide general dashboard information, such as a list of all users with access to this project, general project statistics, and upcoming calendar events (if any).
Current Users
User
Expires
luke.stevens (Luke Stevens)
never
Project Statistics
Records in project
0
Most recent activity
06/20/2012 12:28pm
Space usage for docs
0 MB
Project status
Development
Upcoming Calendar Events (next 7 days)
Time
Date
Description
No upcoming events
The REDCap Consortium | Citing REDCap | Murdoch Childrens Research Institute
REDCap Software - Version 4.9.1 - © 2012 Vanderbilt University

1. Navigation

Links providing navigation options around the REDCap application:

- **Log out**
- **REDCap image** (return to **My Projects** list)
- **My Projects**
- **Project Home** (this page)
- **Project Setup** (see Project Setup)

Also indicated is the current status of the project.

2. Data Collection

Links for record operations:

- Create a new record
- Select and view an existing record
- Navigate between events and forms for an existing record
- Create and view participant schedules

3. Applications

The "applications" are REDCap modules that provide functionality for managing your project and the data it contains. See Applications.

4. Help & Information

Access REDCap's help and training materials.

5. Project Tabs

Access to REDCap's main project configuration screens.

6. Quick Tasks

Shortcuts to selected applications, plus the **Copy Project** option.

7. Dashboard

A brief summary of project-level information.

2.3 Project Lifecycle

2.3.1 Project Status

A REDCap project can exist in one of four status categories at a given time:

1. **Development**
   A project in the design, setup and testing phase. No real data is entered.

2. **Production**
   Real data is being collected. Alterations to project configuration and setup are possible, but should be infrequent and minor.

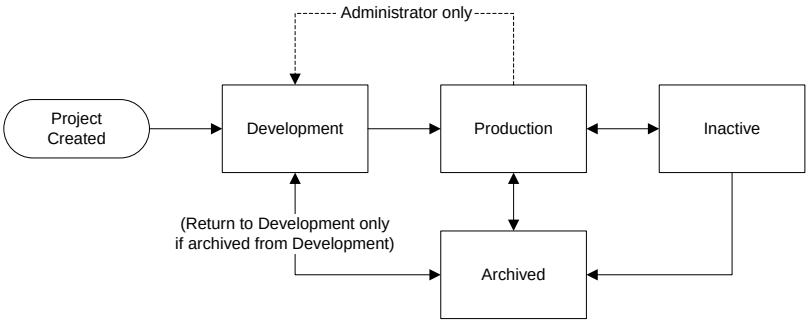
3. **Inactive**
   The project is essentially complete. Most functionality is disabled – including access to individual records – but data can still be exported.

4. **Archived**
   As for inactive projects, functionality is limited. Moreover, the project is no longer shown in the **My Projects** list unless the **Show Archived Projects** option is selected.

2.3.2 Project Status Transitions

Transitions of project status may be accomplished only by users that have Project Design and Setup permissions. See User Rights.

A project need not necessarily progress through these categories in sequence. Indeed, some projects – such as "Practice" projects – may never reach production; others may be archived directly once the Production phase is complete. The diagram below illustrates the allowed transitions:



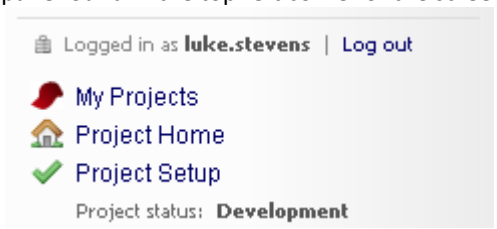
2.4 Project Setup (Development)

You must have Project Design & Setup permissions to perform actions on the Project Setup page.

2.4.1 Navigation

A REDCap project is configured using the work flow tasks on the Project Setup tab of the project view.

The Project Setup page is always available from within a project using the **Project Setup** button in navigation pane found in the top-left corner of the screen.



2.4.2 Work Flow

The Project Setup page contains a series of steps that you will complete to reach the stage where you can progress to the Production status and begin collecting data for real.

Each step is contained within its own “bubble” and can be marked “I’m done!” when completed:

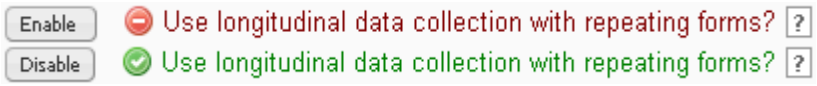
The sections that follow describe the functionality and usage in each step.

2.4.3 Main project settings

Modify project title, purpose, etc.

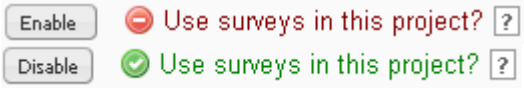
The selections under this option are those that were originally configured during the Create New Project process.

Longitudinal data collection


Enable
Use longitudinal data collection with repeating forms?
Disable
Use longitudinal data collection with repeating forms?

Click **Enable**/**Disable** to toggle the capability for longitudinal data collection: defining events for your participants and designating which of your data entry forms are relevant to each event. See Define your events and designate instruments for them. When disabled each data entry form is associated once and only once with each record.

Surveys



Click **Enable**/**Disable** to toggle the ability to use some of your data entry forms as online surveys. See Online designer for more information on configuring survey forms.

2.4.4 Design your data collection instruments

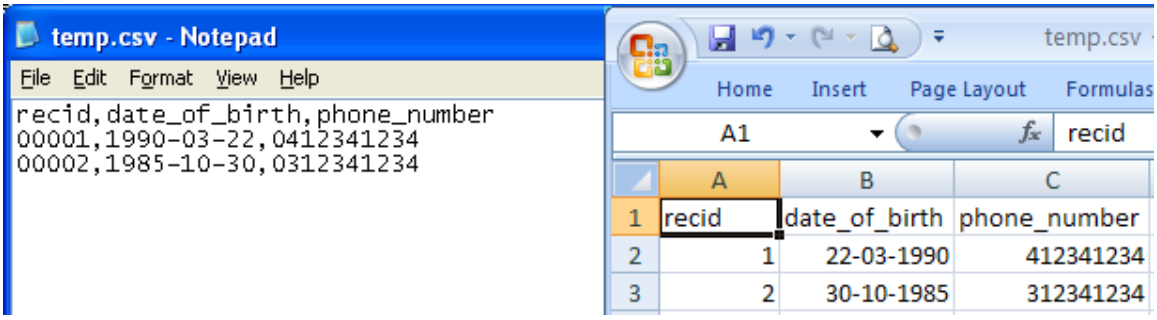
The term "instrument" is synonymous with "form" in referring to a discrete page on which data is entered and viewed in fields. In this context the terms "field" and "variable" are also essentially synonymous.

REDCap provides two methods for creating and editing data collection instruments: using the online designer and via upload of a data dictionary file that is composed in CSV [^] format, typically using Microsoft Excel.

Note on CSV Files

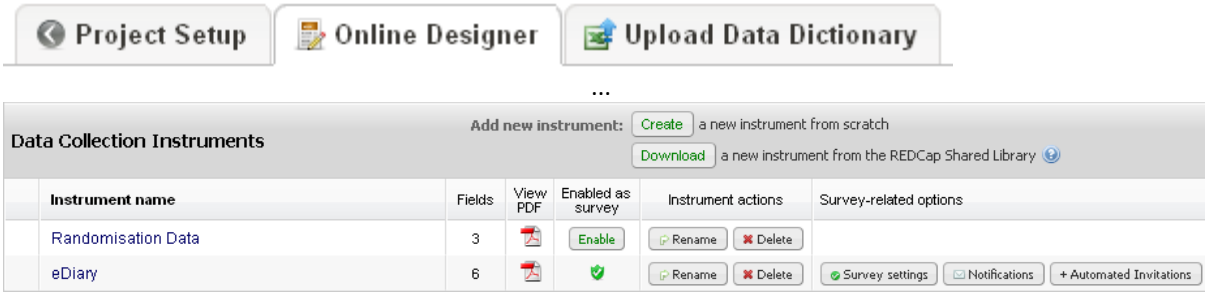
A CSV file is simple plain text with one record per line and columns delimited with a comma – i.e. each individual value in each record is separated by a comma. On Windows computers CSV files are set to open using Excel by default, and Excel will generally use the commas to separate the values into columns, but **a CSV file is NOT an Excel file**.

Beware of Excel's not-so-helpful automatic data formatting: it can cause you to lose format information from CSV data such as leading zeros and specific date formatting...



2.4.5 Online Designer

The Data Collection Instruments view of the Online Designer lists the instruments that exist in a project and provides functions for manipulating them at the instrument level (as opposed to the manipulation of items within an instrument).



Shared Library

The Shared Library is a repository of data collection instruments that can be downloaded and used in your REDCap projects.

Click **Download** to navigate to the Shared Library and view the library's instruments on the library web page or as a PDF. You can download any instrument from the library into your REDCap project.

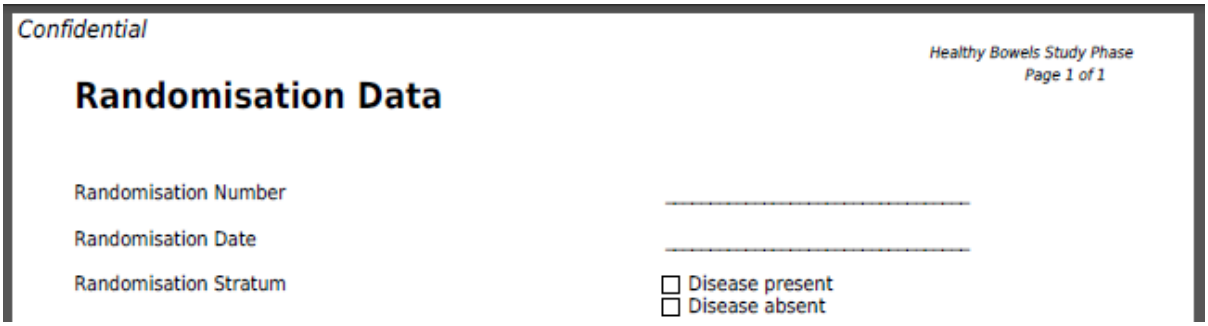
If your project is in production status, you can also upload data collection instruments that you have created to the Shared Library. They will then be available for download by other REDCap users around the world.

Note: Do not share copyrighted material unless you are the owner.

View PDF

Each form can be downloaded in PDF format using by clicking the associated **PDF** icon ( ).

Note that the document produced is not suitable for use as a paper data entry form because it does not provide sufficient guidance on expected data formats and coding to the person completing the form and the data entry person. For example, even three simple fields in the screenshot below would lead to a number of questions:



1. Is Randomisation Number expected to be numeric? Could it be alphanumeric?
2. How many characters are expected for Randomisation Number?

3. What format should be used for writing dates? dd-mm-yy? mm/dd/yyyy? dd-mmm-yyyy? yyyy-mm-dd? Consistency is very important, especially for projects running in a number of countries.
4. How does the data entry person encode the response for Randomisation Stratum? 1=present, 2=absent? 1=present, 0=absent?
5. For all fields, what code can the data entry person enter if data is missing from the form? What about if data is illegible or otherwise raises some query?

Create a New Form

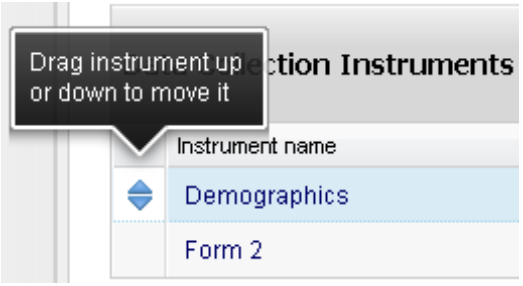
1. Click **Create**
2. Click **Add instrument here** in the position in the list where the new form is to be created (this can be changed later)
3. Assign a name and click **Create**
4. Add variables to the form. The new form will NOT be saved until at least one variable has been added.

Delete a Form

1. Click the **Delete** button (under Actions) for the relevant form
2. Confirm the deletion. The form will be removed along with all of its variables

Reorder Forms

1. Position your mouse cursor over the left-hand end of the form's row
2. Click and drag the row to a new position



Rename a Form

1. Click the **Rename** button (under Actions) for the relevant form
2. Enter the new name and click **Save**

View form fields (variables)

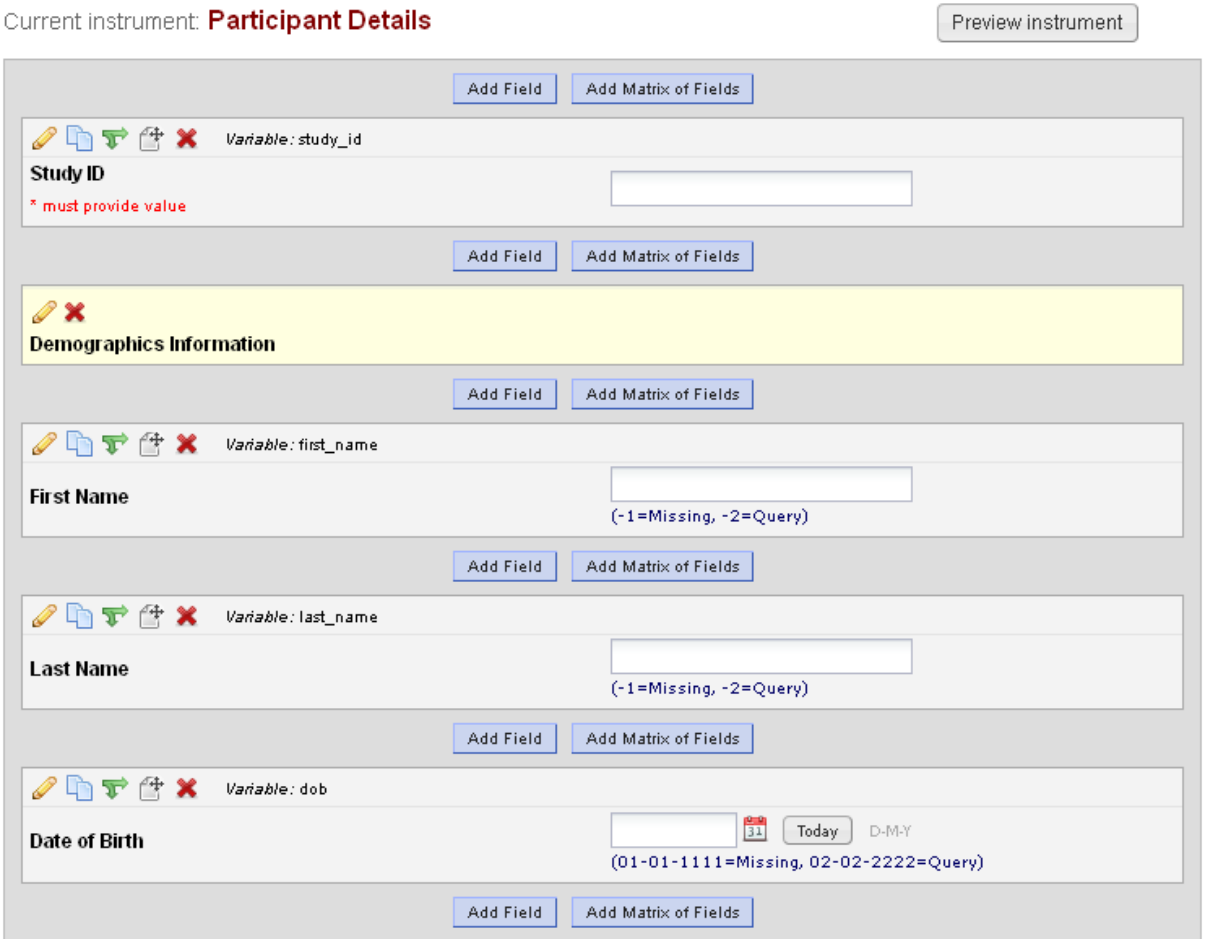
To view and edit the fields (variables) that a form contains, click on the form name.

The view changes to the form edit view, where each field appears in its own block and can be moved, edited, deleted, or have new fields added between them. See Online Designer: Make Changes to a Data Collection Form.

2.4.6 Online Designer: Make Changes to a Data Collection Form

To view and edit the fields (variables) that a form contains, click on the form name.

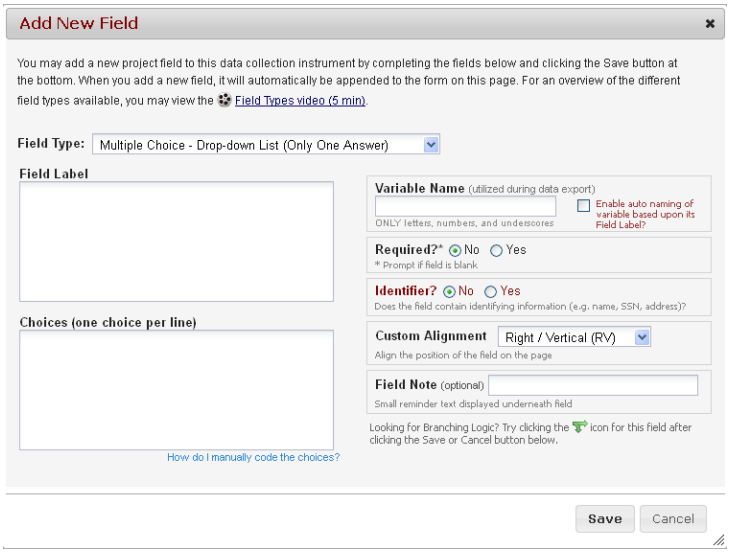
The view changes to the form edit view, where each field appears in its own block and can be moved, edited, deleted, or have new fields added between them.



Add a new field

1. Click **Add Field Here**

2. The **Add New Field** dialog opens
3. Select / enter field configuration information – which is hopefully fairly self-explanatory! – and **Save**
4. **Ensure that any field containing data that can potentially be used to identify an individual is tagged as an identifier.**


Add New Field
You may add a new project field to this data collection instrument by completing the fields below and clicking the Save button at the bottom. When you add a new field, it will automatically be appended to the form on this page. For an overview of the different field types available, you may view the Field Types video (5 min).
Field Type:
Multiple Choice - Drop-down List (Only One Answer)
Field Label
Choices (one choice per line)
How do I manually code the choices?
Variable Name (utilized during data export)
ONLY letters, numbers, and underscores
Enable auto naming of variable based upon its Field Label?
Required?* No Yes
* Prompt if field is blank
Identifier? No Yes
Does the field contain identifying information (e.g. name, SSN, address)?
Custom Alignment
Right / Vertical (RV)
Align the position of the field on the page
Field Note (optional)
Small reminder text displayed underneath field
Looking for Branching Logic? Try clicking the icon for this field after clicking the Save or Cancel button below.
Save
Cancel

See Form Design Considerations for tips on designing data collection forms.

See Styling with HTML and CSS for some ideas on how you can specify some limited customisation of how your form fields are displayed.

Edit a field

1. Click the **Edit** button ( )
2. The **Edit Field** dialog is displayed, which is identical to the **Add New Field** dialog
3. Make the changes required and **Save**

Please see Making Changes to a Production Project for some notes about changing field entry and validation types for projects in production.

Move a field: drag-and-drop

You can re-order fields within a form using drag-and-drop:

1. Click anywhere in the field's block and drag it to its new position
2. The new position is saved automatically

Move a field: button

You can move a field to another form using the **Move** button:

1. Click the **Move** button ( )
2. A dialog box opens with a drop-down list of all fields in your project
3. Select the field that you want the field you are moving to be positioned **after**
4. Click **Move field** and the field will be repositioned

Copy a field

1. Click the **Copy** button ( )
2. Confirm that you wish to copy the field. The copy will be inserted below the field you are copying, and can then be moved, if required.
3. Edit the field's name and label as required.

Branching logic editor

1. Click the **Branching Logic** button ( )
2. The **Add/Edit Branching Logic** dialog opens.
3. Create your branching logic expression using either the **Drag-N-Drop Logic Builder** or by typing a branching logic expression into the **Advanced Branching Logic Syntax** box
4. Click **Save**

See Branching Logic.

Delete a field

1. Click the **Delete** button ( )

2. Confirm the deletion. The field will be permanently deleted. There is no 'Undo'!

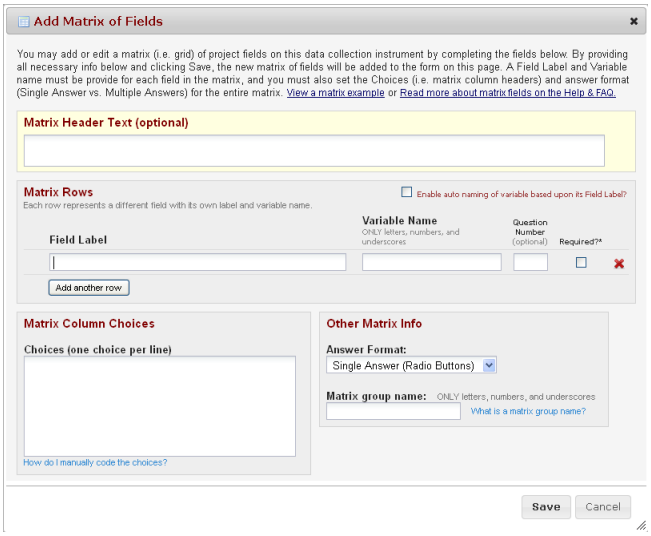
Add a matrix of fields

Where you have a series of categorical fields that share a common set of responses you can create a matrix of fields.

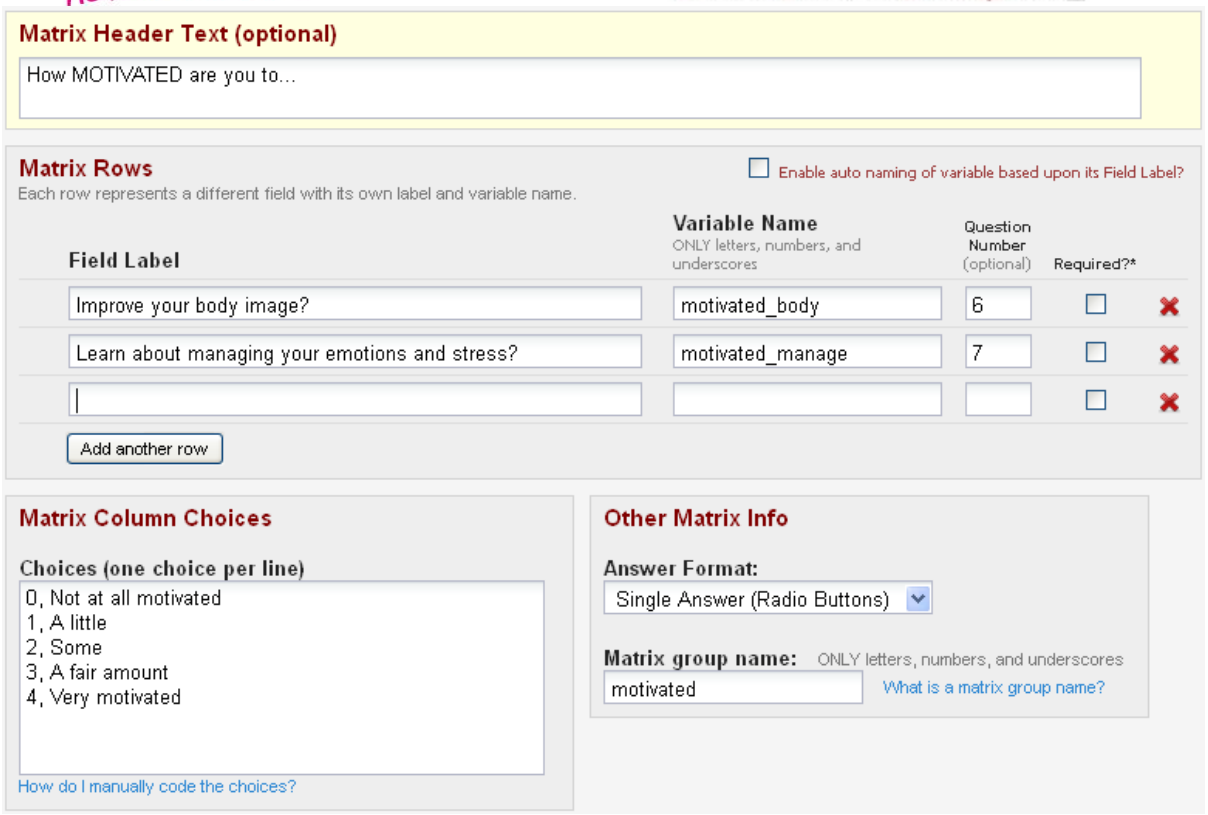
Radio button or checkbox option labels are moved into a shared header section that saves some screen space and helps improve the appearance and usability your form.

1. Click **Add Matrix of Fields**

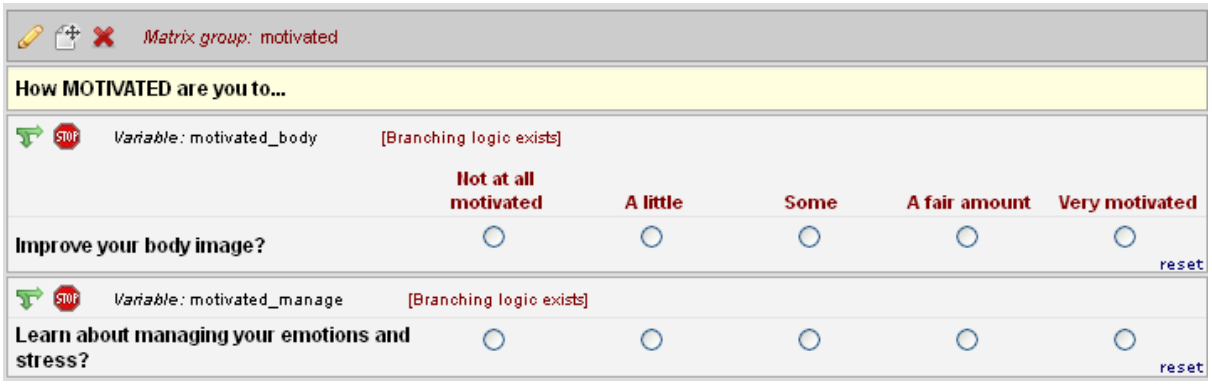
2. The **Add Matrix of Fields** dialog opens


Add Matrix of Fields
You may add or edit a matrix (i.e. grid) of project fields on this data collection instrument by completing the fields below. By providing all necessary info below and clicking Save, the new matrix of fields will be added to the form on this page. A Field Label and Variable name must be provide for each field in the matrix, and you must also set the Choices (i.e. matrix column headers) and answer format (Single Answer vs. Multiple Answers) for the entire matrix. View a matrix example or Read more about matrix fields on the Help & FAQ.
Matrix Header Text (optional)
Matrix Rows
Each row represents a different field with its own label and variable name.
Enable auto naming of variable based upon its Field Label?
Field Label
Variable Name
ONLY letters, numbers, and underscores
Question Number (optional)
Required?*
Add another row
Matrix Column Choices
Choices (one choice per line)
How do I manually code the choices?
Other Matrix Info
Answer Format:
Single Answer (Radio Buttons)
Matrix group name:
ONLY letters, numbers, and underscores
What is a matrix group name?
Save
Cancel

3. Enter the configuration information for your matrix:
   - Matrix Header Text: a section header to appear above the matrix
   - Matrix Rows: these are the fields that are incorporated within the matrix
   - Matrix Column Choices: the response values and labels shared by each field in the matrix
   - Answer Format: radio buttons or check boxes?
   - Matrix Group Name: a unique reference for the matrix



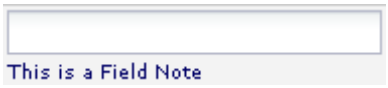
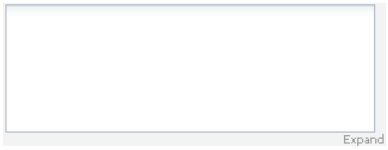
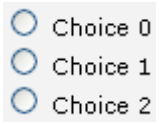
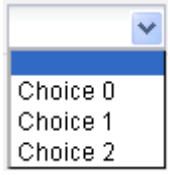
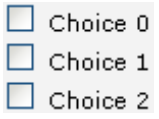
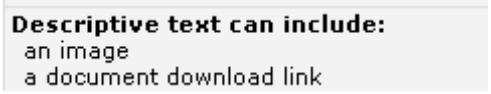
4. Click **Save**. The new matrix will be displayed in the designer



Summary of Field Types

The table provides a brief summary of the different field types available in REDCap and shows how they appear on the data collection form. See Form Design Considerations for more detailed advice and recommendations on good form design.

Use of the Yes/No and True/False fields is not recommended (see Form Design Considerations). Use a radio group or drop-down list instead.

Field Type	Description	Appearance on Form
Section Header	Bold text on yellow background to clearly delineate a boundary between groups of form fields	
Text	Single line plain text entry (here showing an associated Field Note)	
Notes	Multi-line plain text entry. Max number of characters is "large": please don't test it!	
Calculation	Calculation results must be numeric. See Calculated Fields	
Radio Group	"Radio-style" buttons – select one value only	
Drop-Down List	List of values – select one value only	
Checkbox Group	Check boxes enable multiple values to be selected	
Slider	Set a numeric value from 0 to 100 along a horizontal slider	
File Upload	Upload a record-specific document	
Descriptive Text	Additional text can function as a sub-header and/or include an image or file download link	

2.4.7 Online Designer: Survey-related Options

Survey settings

The survey settings provide information to REDCap to control the behaviour of your surveys. Click on the **Survey settings** button to open the **Modify survey settings** tab and set:

- **Survey Status**: An on/off switch for the selected survey form. Can respondents access the survey?
- **Survey Title:** The title of the survey as shown to survey participants. Defaults to the project title, but you can change that here.
- **Question Numbering:** Indicate whether REDCap should number your questions automatically. Auto-numbering does not work if you include branching logic in your survey form because it would lead to gaps in the numbering sequence. You can specify your own custom numbering if preferred.
- **Question Display Format:** Set whether your survey questions should appear on a single page or whether section headings should be used to separate the survey into a series of smaller pages.

  You can use a Descriptive Text field to provide sub headings within these smaller pages.
- **Logo (optional):** Select an image that will be displayed in the survey page header, above the title.

  If you would like more than one image displayed you will need to use image editing software to stitch them together into a single image before loading.
- **Survey instructions:** Specify any introductory text and/or instructions to be displayed at the beginning of the survey.

  You can use the HTML button (HTML) that appears below the text entry box to use HTML and CSS to apply richer formatting and styling to the instruction text. See Styling with HTML and CSS.
- **Survey Expiration:** Specify a date and time after which the survey becomes inaccessible.
- **Allow 'Save & Return Later':** With this option selected, respondents may choose to save their current progress and return to complete the survey later. The respondent is shown a 'return code' that they must make a note of and enter to recommence the survey data entry.

  A respondent's return code can be accessed by project users that have permission to access survey responses. The return code is displayed in the header of the respondents data entry form (see Select an Existing Record to see how to do this).
- **Redirect to a URL:** Specify a web page to which survey respondents will be redirected upon completing the survey.
- **Survey Acknowledgement:** Specify a thank you and acknowledgement message to be displayed upon completion of the survey.

  You can use the HTML button (HTML) that appears below the text entry box to use HTML and CSS to apply richer formatting and styling to the instruction text. See Styling with HTML and CSS.

Notifications

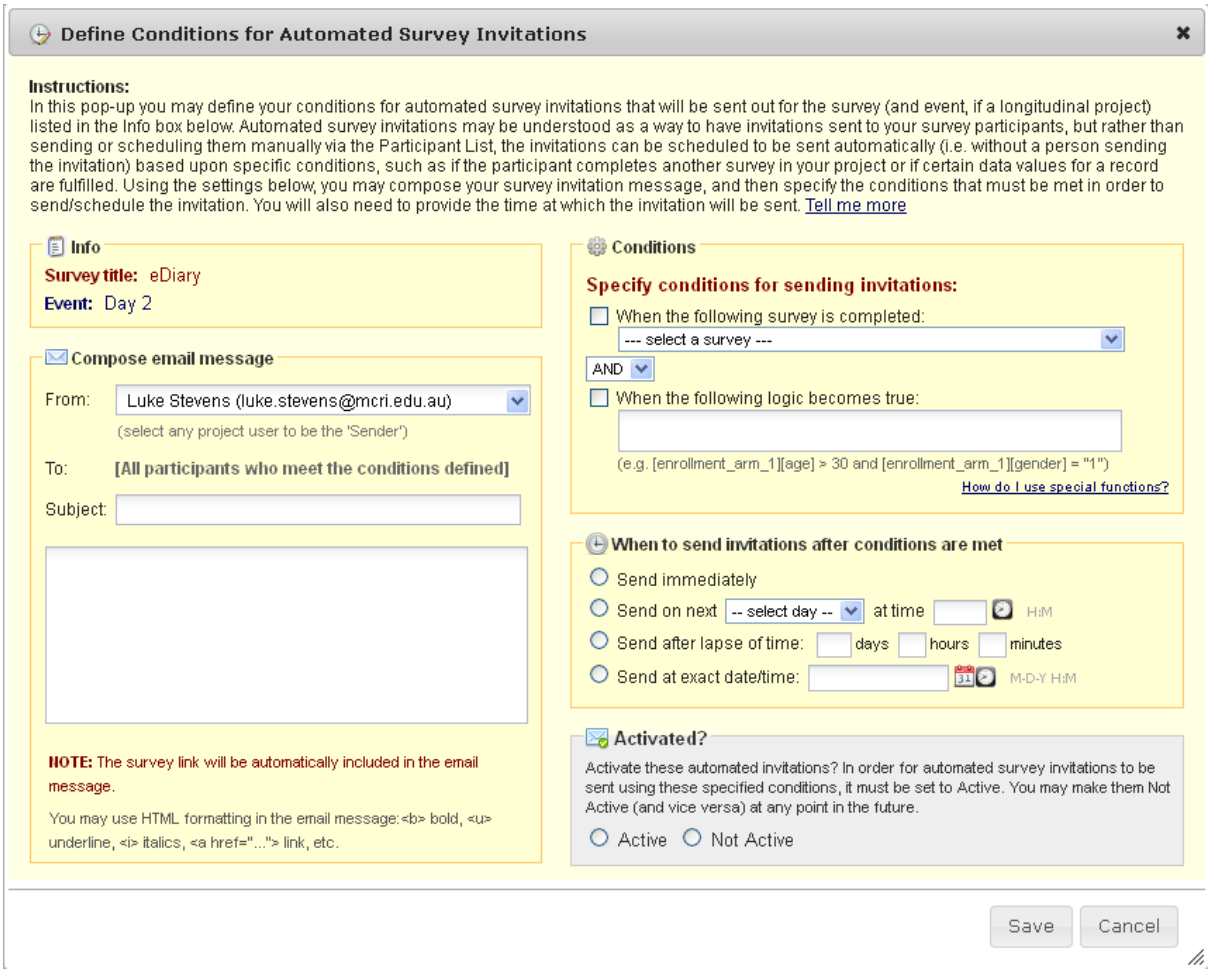
Select email address(es) to which a notification email will be sent upon completion of **every** completed survey response.

The email addresses listed are the primary email address of each user that has been granted access to the project. See User Rights.

Automated Invitations

Email invitations may be sent to participants manually using the Participant List (see Survey Invitations: Invite Participants). Alternatively you can configure invitations to be sent automatically by REDCap upon certain criteria being met using the **Automated Invitations** option.

- Click **Automated Invitations**
- If your project is longitudinal, select the event
- The **Define Conditions for Automated Survey Invitations** dialog is displayed


Define Conditions for Automated Survey Invitations
Instructions:
In this pop-up you may define your conditions for automated survey invitations that will be sent out for the survey (and event, if a longitudinal project) listed in the Info box below. Automated survey invitations may be understood as a way to have invitations sent to your survey participants, but rather than sending or scheduling them manually via the Participant List, the invitations can be scheduled to be sent automatically (i.e. without a person sending the invitation) based upon specific conditions, such as if the participant completes another survey in your project or if certain data values for a record are fulfilled. Using the settings below, you may compose your survey invitation message, and then specify the conditions that must be met in order to send/schedule the invitation. You will also need to provide the time at which the invitation will be sent. Tell me more
Info
Survey title: eDiary
Event: Day 2
Compose email message
From: Luke Stevens (luke.stevens@mcri.edu.au)
(select any project user to be the 'Sender')
To: [All participants who meet the conditions defined]
Subject:
NOTE: The survey link will be automatically included in the email message.
You may use HTML formatting in the email message:<b> bold, <u> underline, <i> italics, <a href="..."> link, etc.
Conditions
Specify conditions for sending invitations:
When the following survey is completed:
--- select a survey ---
AND
When the following logic becomes true:
(e.g. [enrollment_arm_1][age] > 30 and [enrollment_arm_1][gender] = "1")
How do I use special functions?
When to send invitations after conditions are met
Send immediately
Send on next -- select day -- at time H:M
Send after lapse of time: days hours minutes
Send at exact date/time: M-D-Y H:M
Activated?
Activate these automated invitations? In order for automated survey invitations to be sent using these specified conditions, it must be set to Active. You may make them Not Active (and vice versa) at any point in the future.
Active Not Active
Save
Cancel

The **Instructions** text (including that shown when clicking **Tell me more**) is fairly complete, but to summarise:

- **Info:** Displays the event and survey that you have selected

- **Compose email message:** Specify the subject line and bodytext for the email that REDCap will send.

  The participant's URL will be appended to the message. Unfortunately you cannot personalise the message with participant data.

- **Conditions:** Indicate the conditions that – when met – will indicate to REDCap that an invitation is to be sent.

  Ensure that you include the event reference alongside any field reference if your project is longitudinal (as in the example shown in the dialog).

- **When to send:** Specify when REDCap should send the invitation **after the trigger condition has been met.**

  Note that an invitation will still be triggered even if by the time the invitation is sent the participant data has changed such that the trigger would not be met.

- **Activated?**: Toggle the automated sending of invitations on and off.

  Note that you can still send invitations manually via the participant list irrespective of the **Automated Invitations** settings.

2.4.8 Data Dictionary

The REDCap data dictionary is a CSV file that contains the specification of all fields in your data collection forms: the form metadata. In other words, the data dictionary is your project's code book.

Download the Current Data Dictionary

The current data dictionary can be downloaded using the link in the **Design your data collection instruments** section of the **Project Setup** page and also from the Upload Data Dictionary tab, accessible by clicking the **Upload Data Dictionary** button.

Edit the Data Dictionary

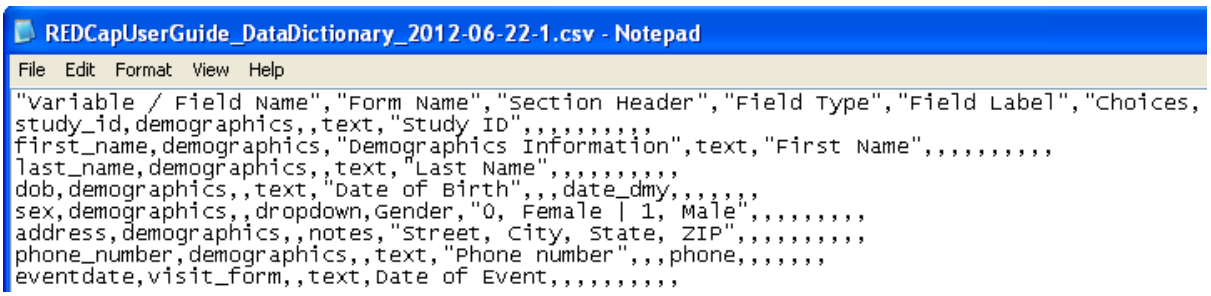
Always download the current version of the data dictionary before making new updates. Changes made using the online designer or by other users will be lost if you make changes in and upload an out-of-date data dictionary.

The data dictionary is in CSV format which is plain text with values delimited with commas (see note). Excel is generally the tool of choice for editing CSV files, but you may use any spreadsheet program or text editor.

Data dictionary in Excel

	A	B	C	D	E	F
1	Variable / Field Name	Form Name	Section Header	Field Type	Field Label	Choices, Calculations,
2	study_id	demographics		text	Study ID	
3	first_name	demographics	Demographics Information	text	First Name	
4	last_name	demographics		text	Last Name	
5	dob	demographics		text	Date of Birth	
6	sex	demographics		dropdown	Gender	0, Female | 1, Male
7	address	demographics		notes	Street, City, State, ZIP	
8	phone_number	demographics		text	Phone number	
9	eventdate	visit_form		text	Date of Event	

Data dictionary in Notepad



When editing the data dictionary there are certain things to bear in mind about what is, and what is not permitted:

You can...

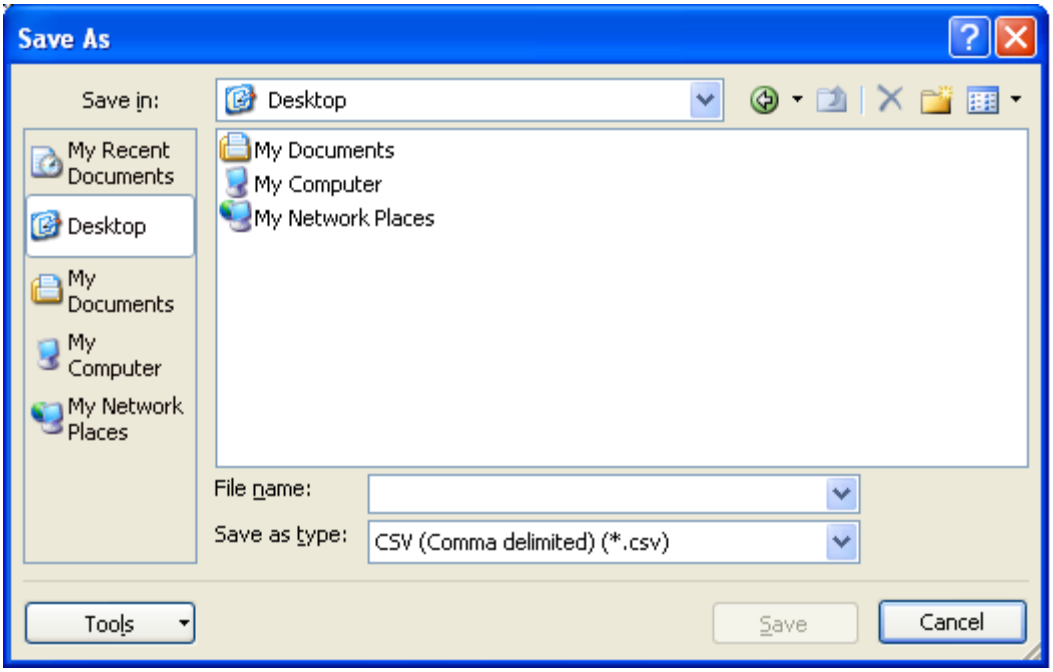
- Add new rows, i.e. add new fields and matrix groups
- Delete rows, i.e. remove fields
- Change form name (although some changes to how names are formatted – e.g. ALL CAPS – must be done using the Online Designer)
- Move fields to a different form
- Re-order fields in a form
- Re-order forms (but ensure that the record id field remains as the top row:, the first field of the first form)

You cannot...

- Add, remove, rename or rearrange columns
- Have any blank rows
- Mix up the fields from different forms – forms' fields must appear together in blocks of adjacent rows

Saving the Data Dictionary

After making changes in the data dictionary ensure that it is saved in CSV format, i.e. with the file extension .csv. Files with other extensions (e.g. .xlsx, .txt) cannot be uploaded.



Upload Data Dictionary

Browse to the file you saved and click **Upload File**. REDCap will load your file and perform a number of validation checks that ensure your settings are valid, for example:

- Check that the file is a valid CSV file containing the expected column headers
- Ensure all required settings are present (e.g. field name, form name, field label)
- Ensure settings are valid (e.g. no spaces in field names, choices specified in the correct format)
- Ensure type and validation settings are consistent (e.g. you cannot have a drop-down list field with a validation type of date)

2.4.9 Online Designer / Data Dictionary Equivalence

Why are there two methods that are essentially equivalent? There are different situations that suit the use of one method over the other:

Use the Online Designer...

- for small changes like adding or editing a single field
- to apply specific formatting to form names
- to gain familiarity with branching logic expressions using the drag-n-drop builder
- tinkering with and testing a calculation
- when you feel like it

Use the Data Dictionary...

- when you have many fields to add, edit or remove
- to utilise Excel features such as auto-fill and copy/paste to quickly specify similar settings to multiple fields
- to keep a record of the current state as a backup that you may want to roll back to
- when you feel like it

These are merely considerations to keep in mind: feel free to use whichever method you are most comfortable with.

And again, **always download the current version of the data dictionary before making changes**. Making changes in and uploading an out-of-date data dictionary will cause more recent changes to be lost.

2.4.10 Define your events and designate instruments for them (Longitudinal only)

To make your project longitudinal go to **Modify project settings** on the **Project Setup** page (see Modify project settings).

When your project is configured as longitudinal you can define a series of events and associate data collection forms with those events. A typical scenario is a longitudinal project where participants undergo certain assessments at defined time points over the duration of their participation in a study, as defined in the study protocol.

Define My Events

To define events click **Define My Events** on the **Project Setup** page. The **Define My Events** page opens.

	Event #	Days Offset	Offset Range Min / Max	Event Name	Unique event name (auto-generated)
✎ ✖	1	0	-0/+0	Enrolment	enrolment_arm_1
✎ ✖	2	1	-0/+0	Randomisation	randomisation_arm_1
✎ ✖	3	7	-0/+0	Follow Up 1	follow_up_1_arm_1
✎ ✖	4	14	-0/+0	Follow Up 2	follow_up_2_arm_1
Add new event		Days Convert from other units	-0 +0	Descriptive name for this event	

Notes:

- The edit button (✎) facilitates editing a record
- Use the delete button (✖) to remove an event from the schedule
- To add an event, enter data into the text boxes then click **Add new event**
- The number of events you can define is limited only by your patience for creating them and assigning forms!
- **Days Offset** is the number of days from an arbitrary baseline on which an event will be created when using the Scheduling module. If not using the Scheduling module Days Offset is just for information.
- **Days Offset** can be negative
- **Offset Range** is a number of days before (-) or after (+) the date set using Days Offset. There is no special significance to this range within REDCap, other than that a warning message is displayed if you move the scheduled event date to a date that is outside of the range. For example, an event is scheduled on 10th June +/-5 days. If the event is rescheduled to a date before 5th June or after 15th June a warning message is displayed that prompts the user to confirm that they accept the new out-of-range date. See Scheduling for more information about the Scheduling module.
- Note the settings for **Unique event name**. These codes are used when importing and exporting longitudinal data.

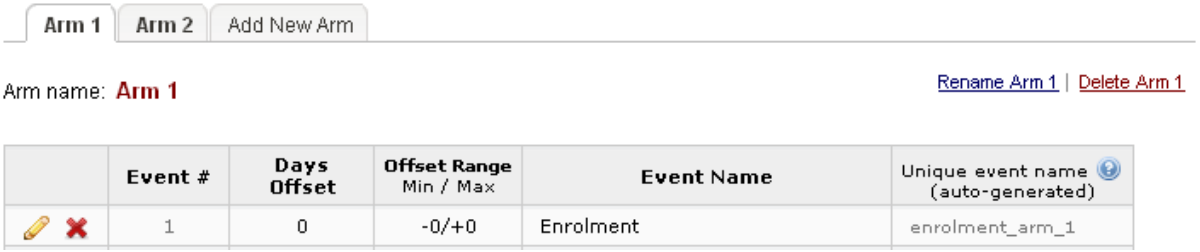
Designate Instruments for My Events

To assign data collection forms to events click **Designate Instruments to My Events** on the **Project Setup** page or on the **My Events** page. The event setup page opens.

Defining Arms

REDCap's Arm functionality enables you to create alternative event schedules for different groups of participant: different randomised treatments, for example.

Name your arms and set up the events as described for Define My Events.



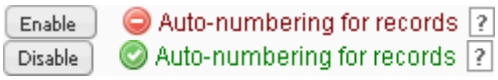
Participant records are assigned to an Arm when they are created. **It is not possible to later edit the arm to which a record is assigned**, although it is straightforward to export data, delete the record and recreate it in the correct arm, and then import the record's data.

Projects where the arm is not known at the time records need to be created (a project with an enrolment phase, followed by a randomisation at a later date, for example) should be set up with an arm specifically for the initial phase, as well as arms for the randomised treatment phase. Following randomisation a record can be created in the appropriate randomised arm with a record id that matches the record in the initial arm.

Refer to Arm Setup for Screening Phase and Randomised Phase for an example.

2.4.11 Enable optional modules and customizations

Auto-numbering for records



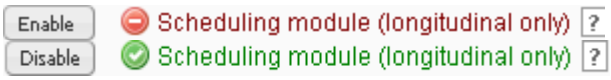
Toggle whether you want REDCap to create unique record identifiers (e.g. study ID) using a sequential number, or require the data entry person to enter each new record identifier.

When using auto-numbering you can have your sequence begin with a number other than 1 using the following strategy:

1. With record auto-numbering **disabled**, create a dummy record with an identifier one less than your desired start number
2. Enable record auto-numbering
3. Create a new record – this will become your first record
4. Delete the dummy record

For example, if you want your first record to be numbered 1001, disable record auto-numbering, add a record with id=1000, enable record auto-numbering, create another new record (id=1001 will be assigned), then delete record 1000.

Scheduling module



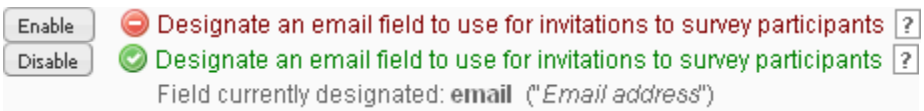
Applicable only when you have enabled longitudinal data collection in your project. See Longitudinal data collection.

The scheduling module works in conjunction with the events you have created for your longitudinal project (See Define your events). It enables you to generate an event schedule for each individual project record, typically a calendar of a participant's study visits. See Scheduling for a description of how to use the Scheduling functionality.

Randomization module

It is currently not possible to enable the randomisation module. Please contact the REDCap Administrator if you want to utilise web-based randomisation in your project.

Designate an Email Field


Enable
Designate an email field to use for invitations to survey participants
Disable
Designate an email field to use for invitations to survey participants
Field currently designated: email ("Email address")

Applicable only when you have enabled surveys in your project. See Surveys.

You can select a field from your data entry forms that REDCap will use to build the Participant List and when sending automated survey invitations.

Additional customizations

Various additional customisations are available, and the **Make optional customizations to your project** dialog provides comprehensive information about usage for each. In summary:

- **Define a secondary unique field**
  - A field in addition to the primary record identifier for which REDCap will ensure the uniqueness of all values
  - Values will also be included alongside the primary record identifier in the record selection lists
  - It is not possible to specify that the combination of two or more fields be unique

- **Order fields by another record**
  - Select a field other than the primary record identifier by which to sort records in the record selection lists

- **Set a custom record label**
  - Specify other fields, data from which is included alongside the record identifier in the record selection lists
  - Very useful! See Linked Projects for an example

- **Enable the data history widget**
  - Leave this ticked!

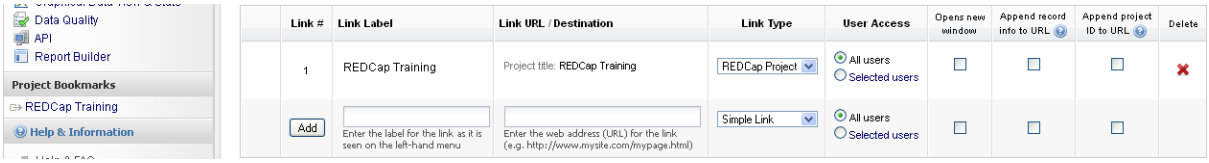
- **Display the Today/Now button for all date and time fields**
  - It is common to have option ticked but the feature is used less often than you might think, except in testing
  - This is a project-level setting: it is not possible to set this for individual fields

- **Require a 'reason' when making changes to existing records?**
  - With this option selected, the user must enter some text as a “reason for change” each time a form is saved – except when the record is initially created
  - Users can find this intrusive for longitudinal or multi-form projects as the dialog box appears even when entering new data on a form that is not the first form (i.e. when the record is created)

2.4.12 Set up project bookmarks (optional)

This optional task enables configuration of links to other REDCap screens or projects, or to external web pages. To create these links, select **Add or edit bookmarks** on the **Project Setup** page.

The bookmarks appear in a **Project Bookmarks** section in the left-hand menu panel.



Notes:

- Create a bookmark by completing the information required in the table row and click **Add**
- Bookmarks can be re-ordered by clicking and dragging a bookmark record
- Edit buttons ( ) appear when you hover your mouse pointer over a bookmark's **Link Label** and **Link URL / Destination** values
- Use the delete button ( ) to remove a bookmark
- **Link Type**
  - **REDCap Project:** choose from the list of REDCap projects that you have permission to access
  - **Simple Link:** a simple URL to, for example, and external web page
  - **Advanced Link:** as with the Simple Link, a URL to, say, an external web page, but REDCap sends additional information (e.g. user and project info) to the target website as a means of verifying the identity of the REDCap user on that external site
- **User Access:** control which users of the current project can see the bookmark. Select either **All users** or select specific users individually by selecting **Selected users**
- **Append record info to URL:** when selecting the bookmark from a record data screen, pass through information about the record being viewed on the URL.. For example:

  http://othersite.com/?record=1001&event=randomisation_arm_1&pid=493
- **Append project ID to URL:** pass through the project id on the URL. For example:

  http://othersite.com/?pid=493

2.4.13 User Rights and Permissions

User Rights functionality enables you to give other REDCap users access to your REDCap project, if you wish.

User Rights

See User Rights in the Applications section for more information. In summary, the **User Rights** page enables you to:

- Add and remove access to your project for other REDCap users
- Control which Applications each user can access for your project
- Control the record operations that each user is permitted to perform
    - Create records
    - Rename records (i.e. edit a record id)
    - Delete records
- Control the level of access each user is permitted to each specific data collection form
    - No access
    - Read-only access
    - Full edit access

Data Access Groups

The **Data Access Groups** tab can be accessed from the **Project Setup** page using the **Data Access Groups** button, or from the **User Rights** page by selecting the **Data Access Groups** tab.

A Data Access Group is an arbitrary entity that can be thought of as analogous to a study site. Individual users can be assigned to a single Data Access Group, as can project records. Records that a group user creates are automatically assigned to that group. **A user in a Data Access Group has access only to records that are also assigned to that Data Access Group.**

For example, you as the project owner create a Data Access Group called “Sydney Site”. Your collaborator has had a REDCap account created for them by the REDCap administrator, and you assign her username to the Sydney Site group. The collaborator can view records that she creates or that you assign to Sydney Site, but not any records that are assigned to other groups, or that are unassigned to any group.

See User Rights for more details.

2.4.14 Move your project to production status

Why?

All of REDCap's functionality is available to projects during the development phase, and after moving to production there are restrictions placed on certain aspects of project configuration (see below, Making Changes to a Production Project). So why bother performing this step and changing the status of your project?

1. It is a clear indication to users that the data in the project is real, potentially irreplaceable project data to be treated with due care and attention.

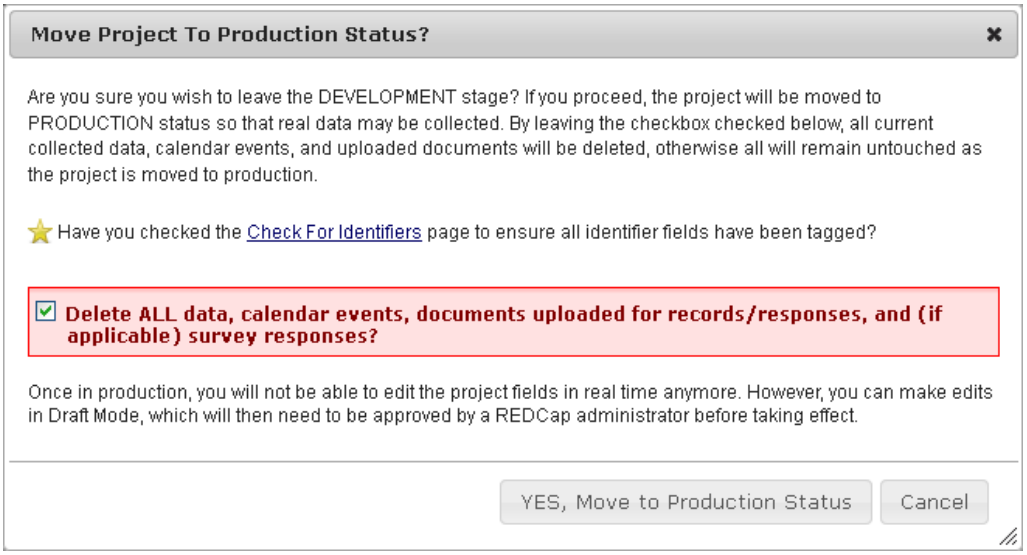
2. The restrictions on project configuration are in place to protect the integrity of your real data. Making certain types of change can result in **data loss**, and so should not be made without fully understanding the ramifications.

When?

- Have you completed all of the setup steps described throughout Project Setup (Development)?
- Have you thoroughly tested the setup of your project using realistic data?
- If you can answer "yes" to both of these questions then you are ready to do some more testing. No, really! Refer to Testing for some guidance and suggestions around testing database systems (not just REDCap).

How?

Click the **Move project to production** button. The confirmation dialog shown below is displayed.


Move Project To Production Status?
Are you sure you wish to leave the DEVELOPMENT stage? If you proceed, the project will be moved to PRODUCTION status so that real data may be collected. By leaving the checkbox checked below, all current collected data, calendar events, and uploaded documents will be deleted, otherwise all will remain untouched as the project is moved to production.
Have you checked the Check For Identifiers page to ensure all identifier fields have been tagged?
Delete ALL data, calendar events, documents uploaded for records/responses, and (if applicable) survey responses?
Once in production, you will not be able to edit the project fields in real time anymore. However, you can make edits in Draft Mode, which will then need to be approved by a REDCap administrator before taking effect.
YES, Move to Production Status
Cancel

Note that all development phase data in your project will be deleted when you perform the move to production unless you remove the tick from the Delete ALL data **box.**

Check For Identifiers

Also note the **Check for Identifiers** step. It is recommended that you perform the check for identifiers to ensure that all fields that contain participant identifiers – or indeed may contain any information that could potentially be used to identify a participant – are marked as identifying fields. This helps to protect confidential data from access by users that are not permitted to view it. See Data Export.

2.5 In Production

2.5.1 Differences from Development

A quick summary of what changes when your project is moved from development into production:

1. The green tick icon is displayed against the project in the **My Projects** listing
2. No more "erase all data" option (see Other Functionality)
3. Certain project configuration alterations are restricted (see below, Making Changes)
4. Changes to data collection form fields no longer occurs in real time (see below, Making Changes)
5. Versions of the data dictionary are maintained and are available for download from the **Project Revision History** tab

2.5.2 Making Changes to a Production Project

What You Can Change

- **Project Setup**
  - **Project settings and customisations**
    It is possible to alter your selections for these project-level settings (see Main project settings, Enable optional modules and customizations). However, whilst amending the project title might well be fine, changing the type or structure of the project (e.g. implementing surveys, or changing from the non-longitudinal model to longitudinal) should not be necessary and is **not recommended**.

    If you find that wholesale changes are required to project setup and structure, it is recommended that you create a new project with the new setup, test it fully, and then import data from the existing project. The existing project will then become obsolete and can be archived, preserving its current state in case you ever need to look back at it.

  - **User Rights and Permissions**
    Managing the access and permission levels of users in the project is an ongoing process. It is normal that users are added, removed and edited throughout the lifetime of the project.

    Alterations to Data Access Group set up during the production phase is also permitted, and should cause no problems.

  - **Events**
    Edits to the project arms, events and event/form designation are permitted, but **only** by the administrator and are not recommended. If you really must make alterations to your arm and event setup, here are some issues to be aware of:
    - **Add a new arm**
      Adding a new arm is fine. The new arm becomes available for selection when creating records.

    - **Editing an arm**
      Arm name change is OK, as are some changes to arm events. See below.

- **Delete an arm** 🔴
  Possible but you will **lose data** on the records assigned to the deleted arm.

- **Add a new event** 🟡
  New events can be added, but be aware that the new event will **NOT** be added to existing schedules. Nor is there a way that it can be added.

- **Editing an event** 🟡
  Alterations to event name and offsets can be made. Alterations to the offset days are **NOT** reflected in existing schedules.

- **Delete an event** 🔴
  Possible but you will **lose all data** associated with the event.

- **Designate an additional form to an event** 🟢
  Is fine. The newly designated form becomes available for the event to all records in the arm.

- **Remove a form from an event** 🔴
  Possible, but you will **lose all data** for the event/form combination.

The prospect of **data loss** is rightly scary, but if the alteration is important enough it can be possible to make changes such as those described above whilst maintaining your data. It is always possible to download your data (Data Export) and re-import it (Data Import) into the project post-change. Some manipulation of the data may be required so that it matches the format that the project requires after the setup change has been made.

- **Data Collection Forms**

  Changes to data collection forms are a ubiquitous feature of real projects. See Draft Mode for a description of the change process.

  When drafting changes there are no changes that are technically off limits but there are some types of change that can lead to problems. Here is a summary:

  - **Change Form name** 🟢
    Renaming and forms is fine.

  - **Change Form order** 🟡
    Generally unproblematic, but to make a different form the first form you must use the data dictionary because the record id field must remain the first field of the first form (i.e. row 2 of the CSV file).

  - **Change Form fields** 🟡
    Fields may be added, edited or deleted. Deleting fields will, of course, result in **data loss** if data has been saved for the fields, but also be careful when changing field type. Certain field type changes may also result in **data loss** (see below).

  - **Add a new form** 🟢
    New forms can be created, either with new fields or using a subset of fields from a different form.

  - **Delete a form** 🟡
    Moving all fields from one form onto another form is fine, but deleting fields will result in **data loss** if any data has been saved for those fields.

- **Add a field**
  Adding new fields to forms is fine.

- **Delete a field**
  Deleting a field is fine provided that you understand that any data has been saved for the field will be **lost**.

- **Edit a field**
  Some types of edit are unproblematic, but others may have repercussions.
  - **Change field name**
    Changing the name of a field is effectively the same as deleting the original and creating a new, similar field. Any data saved under the original name will be **lost**.

  - **Change label, required, identifier, field note**
    Changes to these aspects of field setup are unproblematic.

  - **Change range min/max, branching logic**
    Changes to these aspects of field setup are fine, although may lead to warnings when opening or saving forms if existing data conflicts with the new field setup, for example:
    - an existing value is now outside the valid range
    - new branching logic is attempting to hide fields that have data saved for them

  - **Change field type**
    Some type changes are fine, but some may result in **data loss**. Use common sense! Changing anything to a text field is fine, but you can't (necessarily) change text data to be numeric data appropriate for display as a specific selection in a radio button group field.

  - **Change field validation type**
    Here again, use common sense! You can change from integer to number, for example, but not necessarily from number to integer. Date to text (i.e. no validation) is fine; text to date will mean text data that does not correspond to a valid date(/time) value in yyyy-mm-dd(/hh:mm:ss) format cannot be displayed.

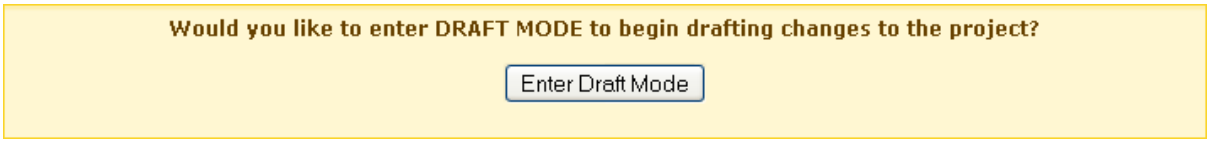
  - **Change field encoding (values / value labels)**
    Adding new values and labels to a categorical field is fine. Recoding is **dangerous**! If you re-assign a new label to an existing value code, all data stored with that code now shows with the new label.

  See Data Model for a description of how REDCap stores data that will help illustrate why some of these changes can lead to problems.

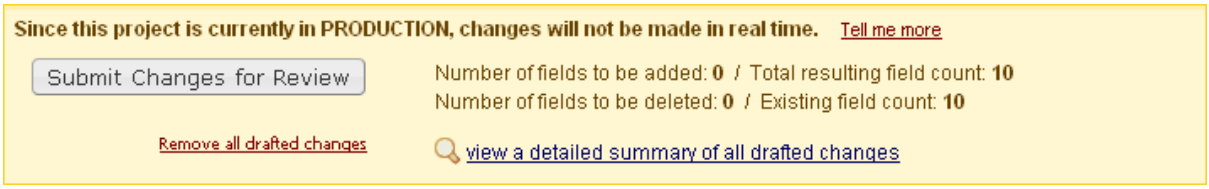
Changes to Data Collection Forms: Draft Mode

Whilst in development any changes you make are made immediately. To protect you from some of the potential problems outlined above, when your project is in production all changes are made in Draft Mode.

To make changes, click **Online Designer** or **Upload Data Dictionary** on the **Project Setup** page of your production project. The system asks you to confirm that you wish to enter draft mode.



Make the changes required using the online designer or the data dictionary (or both). Each page displays the Draft Mode summary shown below.


Since this project is currently in PRODUCTION, changes will not be made in real time. Tell me more
Submit Changes for Review
Number of fields to be added: 0 / Total resulting field count: 10
Number of fields to be deleted: 0 / Existing field count: 10
Remove all drafted changes
view a detailed summary of all drafted changes

Your options in this summary are:

- **Remove all drafted changes**: scrap all changes and exit Draft Mode
- **View a detailed summary**: show a summary that highlights the changes you have drafted
- **Submit Changes for Review**: REDCap will assess the potential impact of your changes to determine whether there are any "critical issues", i.e. changes that have the potential to lead to data loss.

Situation	Risk, Potential Impact	Outcome
Project has no records	No risk of data loss	Changes automatically approved
No critical issues	No risk of data loss	Changes automatically approved
Critical issues found, e.g. • Deleting field • Recoding categorical field	Potential for data loss	Administrator notified that drafted changes are ready for review

Upon receiving notification that a project has drafted changes for review, the administrator looks at the summary page to check that none of the changes proposed will lead to data loss. If there are no problems, the administrator approves the changes and the new setup becomes available to all project users.

Changes to Data Collection Forms: Testing

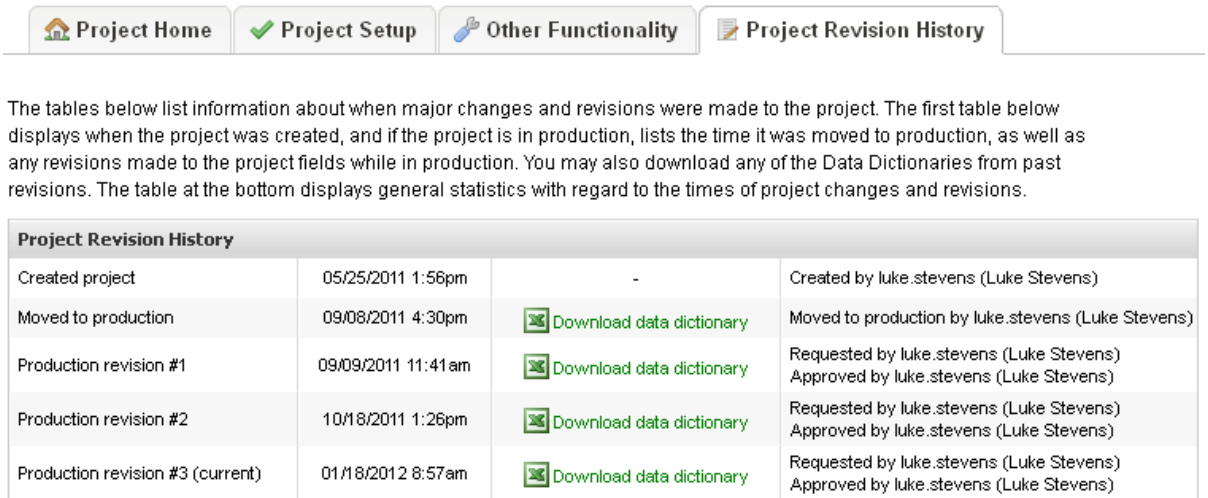
When drafting changes in draft mode, the current versions of your data collection forms remain active in the system. This is a problem if you are making any non-trivial alteration because you are unable to test the draft changes to ensure that it functions as you expect.

You have two options to work around this issue:

1. Create a practice project and set it up with the new fields you require along with any dependencies. This method is particularly suited to testing calculation and branching logic expressions.

2. Create a copy of the project, including an import of the current data. Make the changes in this copy and test thoroughly with the real data. Depending on the type and extent of the changes it may even be more practical to move the copied project into production (with refreshed live data) and archive the original, now out-of-date project.
   This method is particularly suited to changes implementing new forms and/or event schedules.

2.5.3 Project Revision History


Project Home
Project Setup
Other Functionality
Project Revision History
The tables below list information about when major changes and revisions were made to the project. The first table below displays when the project was created, and if the project is in production, lists the time it was moved to production, as well as any revisions made to the project fields while in production. You may also download any of the Data Dictionaries from past revisions. The table at the bottom displays general statistics with regard to the times of project changes and revisions.
Project Revision History
Created project 05/25/2011 1:56pm - Created by luke.stevens (Luke Stevens)
Moved to production 09/08/2011 4:30pm Download data dictionary Moved to production by luke.stevens (Luke Stevens)
Production revision #1 09/09/2011 11:41am Download data dictionary Requested by luke.stevens (Luke Stevens) Approved by luke.stevens (Luke Stevens)
Production revision #2 10/18/2011 1:26pm Download data dictionary Requested by luke.stevens (Luke Stevens) Approved by luke.stevens (Luke Stevens)
Production revision #3 (current) 01/18/2012 8:57am Download data dictionary Requested by luke.stevens (Luke Stevens) Approved by luke.stevens (Luke Stevens)
Project Revision Statistics
Time since project creation 394.3 days
Time in development 106.1 days
Time in production 288.2 days
Time since last revision 156.5 days
Average / median time between revisions 43.9 days / 39 days

The **Project Revision History** tab gives you access to the details of each version of the data dictionary that has been live since your project has been in production. You can download any of the data dictionary CSV files.

2.6 Other Functionality

You must have Project Design & Setup permissions to perform actions on the Other Functionality page.

The **Other Functionality** tab provides some additional project tools:

- **Move to inactive status (production only):** Prevent access to all project functionality except Data Export, File Repository, Logging and User Rights.
- **Move to production status / Move to production status (archived only):** Return the project to its pre-archival state.
- **Copy the project:** Make an exact duplicate of the project, including configuration, forms/fields and users. Data will NOT be copied, and you will be prompted for a different project title.
- **Delete the project (development only):** Removes the project entirely. All data will be deleted. **Be careful: there is no 'Undo'!**
- **Erase all data (development only):** Clears out all data from your development project, including participant records, form data and scheduling and calendar data.
- **Archive the project:** Prevent access to all project functionality except Data Export, File Repository, Logging and User Rights. Also removes the project from the **My Projects** list, unless the **Show Archived Projects** option is selected.

3 Data Entry

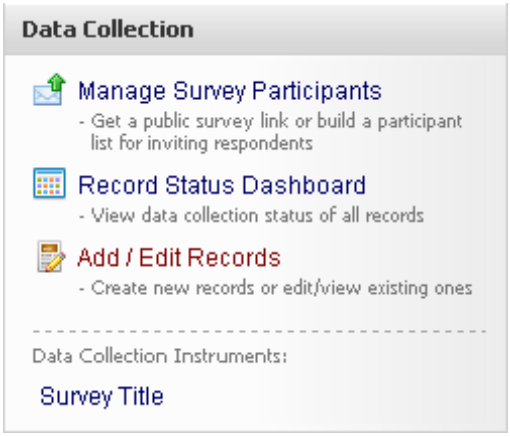
This section contains information on creating and managing data records: creating, searching, editing and deleting records, along with other tasks associated with managing records in your project, such as survey invitations and participant schedules.

3.1 Data Entry Navigation

Navigation to record and data entry pages varies slightly according to the project type and the collection format for the data entry forms, i.e. whether a project contains survey forms or is longitudinal. The **Data Collection** panel in the left-hand menu of the project page reflects the project settings.

Note: in each case an **Edit instruments** button is displayed whilst the project is in development.

3.1.1 Data Entry Navigation: Survey


Data Collection
Manage Survey Participants
- Get a public survey link or build a participant list for inviting respondents
Record Status Dashboard
- View data collection status of all records
Add / Edit Records
- Create new records or edit/view existing ones
Data Collection Instruments:
Survey Title

Manage Survey Participants
Manage your survey respondents and track responses

Record Status Dashboard
View a single-page summary of the status of all surveys (and data entry forms, if applicable) for all records

Add / Edit Records
Select a record and view data, or create a new record either via a survey page or as regular data entry

Data Collection Instruments - **<Form name>**
Select a record and view a specific form

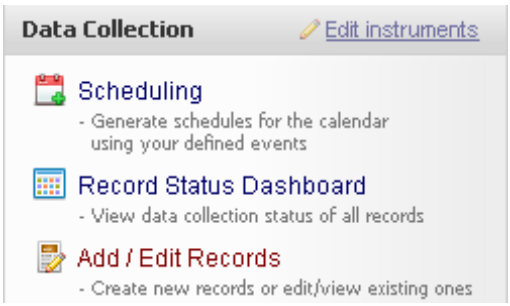
3.1.2 Data Entry Navigation: Data Entry Forms (Non-Longitudinal)

Record Status Dashboard
View a single-page summary of the status of all surveys (and data entry forms, if applicable) for all records

Add / Edit Records
Select a record and view data, or create a new record

Data Collection Instruments - **<Form name>**
Select a record and view a specific form

3.1.3 Data Entry Navigation: Data Entry Forms (Longitudinal)


Data Collection
Edit instruments
Scheduling
- Generate schedules for the calendar using your defined events
Record Status Dashboard
- View data collection status of all records
Add / Edit Records
- Create new records or edit/view existing ones

Scheduling
Displayed only if Scheduling is enabled under Enable optional modules and customizations

Record Status Dashboard
View a single-page summary of the status of all surveys (and data entry forms, if applicable) for all records and events

Add / Edit Records
Select a record and view data, or create a new record

3.2 Record Operations

3.2.1 "Record Identifier" Defined

As in any database, your project records must be uniquely identifiable. REDCap projects must all define a "record identifier" field as the first field on the first form: `study_id` in the example shown below.

	A	B	C	D	E	F
1	Variable / Field Name	Form Name	Section Header	Field Type	Field Label	Choices, Calculations,
2	study_id	demographics		text	Study ID	
3	first_name	demographics	Demographics Information	text	First Name	
4	last_name	demographics		text	Last Name	
5	dob	demographics		text	Date of Birth	
6	sex	demographics		dropdown	Gender	0, Female | 1, Male
7	address	demographics		notes	Street, City, State, ZIP	
8	phone_number	demographics		text	Phone number	
9	eventdate	visit_form		text	Date of Event	

In any changes you make to your project's data collection forms it is essential that the record identifier field remain the first field of the first form, but provided there are no records in your project you are free to change the field name from `study_id`. See Design your data collection instruments and Changes to Data Collection Forms: Draft Mode.

It is typical, of course, that project records correspond to individual participants, but it need not necessarily be the case. Refer to Use Cases for some examples of REDCap projects with records that correspond to entities other than study participants.

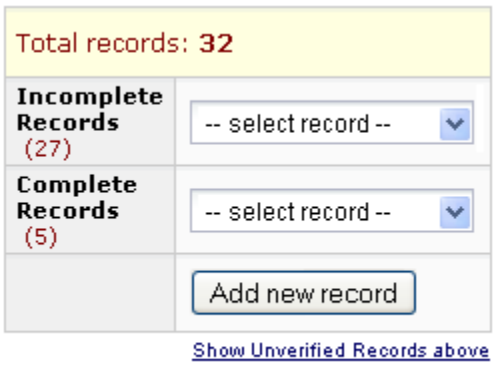
3.2.2 Creating a New Record

There are three ways that records can be created in your REDCap project:

1. Auto-numbered (includes projects where records are created via a survey)
2. Manual entry
3. Import

Record Auto-Numbering: Data Entry Forms Project

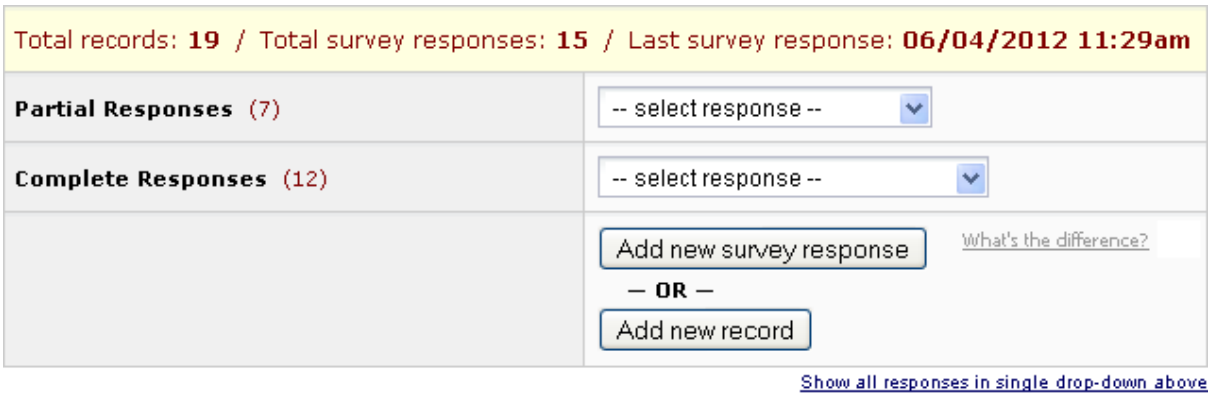
With record auto-numbering switched on (see Auto-numbering for records) records are created by clicking the **Add new record** button.



If you project has multiple arms, you must select the appropriate arm before creating the record. See Creating a New Record: Arms.

The first data entry form will open and show the new record identifier. This identifier is **not yet saved** – it will be reused if you do not save the form and may change if another user creates a new record whilst you have the data entry form open.

Record Auto-Numbering: Survey Project


Total records: 19 / Total survey responses: 15 / Last survey response: 06/04/2012 11:29am
Partial Responses (7)
-- select response --
Complete Responses (12)
-- select response --
Add new survey response
What's the difference?
— OR —
Add new record
Show all responses in single drop-down above

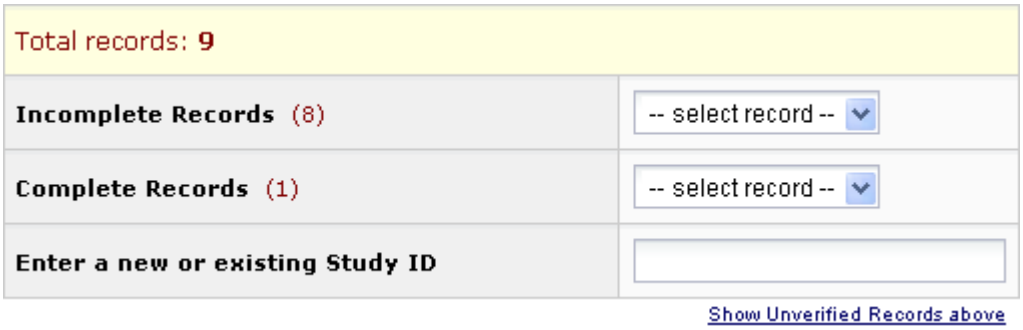
All survey-only projects have auto-numbered records because there is no necessity for survey forms to include any identifiers. There are two options for logged-in users creating records:

1. **Add new survey response**: opens the survey form in a new window enabling the user to create an anonymous response exactly as if a respondent was completing the survey.

2. **Add new record**: create the new record on a data entry style form. The record creation is associated in the log with the user that created it.

The **What's the difference?** button displays some similar explanatory text.

Manual Entry of Record Identifier


Total records: 9
Incomplete Records (8)
-- select record --
Complete Records (1)
-- select record --
Enter a new or existing Study ID
Show Unverified Records above

With record auto-numbering switched off (see Auto-numbering for records) records are created by entering the new record identifier into the text entry box.

The first data entry form will open and show the new record identifier. **The new record (and its identifier) is not saved until you save the data entry form.**

If you project has multiple arms, you must select the appropriate arm before creating the record. See Creating a New Record: Arms.

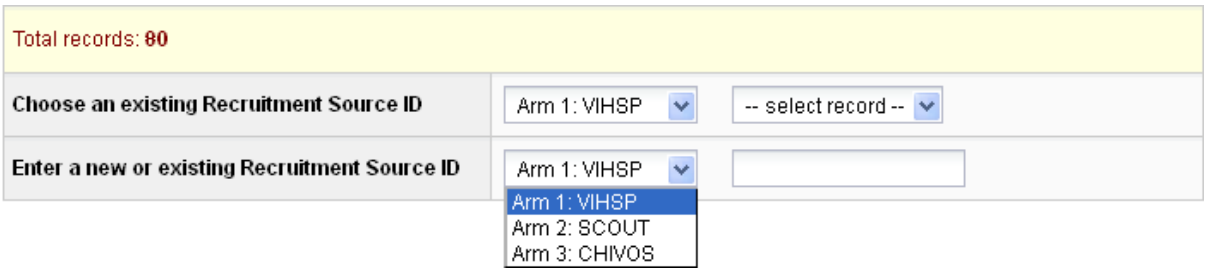
Data Import

See Data Import for more information about importing data.

Data import files must contain a record identifier column (e.g. `study_id`), and the record identifier value (e.g. 1001) must be present in each data row.

3.2.3 Creating a New Record: Arms

You must select the arm appropriate to your new record before creating the record in the same manner as described above.


Total records: 80
Choose an existing Recruitment Source ID
Arm 1: VIHSP
-- select record --
Enter a new or existing Recruitment Source ID
Arm 1: VIHSP
Arm 1: VIHSP
Arm 2: SCOUT
Arm 3: CHIVOS

For longitudinal-type projects where multiple Arms are defined (see Defining Arms), each arm functions essentially as a distinct project. **Record identifiers are unique only within an arm**: you can have a record identified with study_id=1001 in both Arm 1 and Arm 2, for example.

It is not possible to ensure that a record identifier is unique within the project, although REDCap does provide a warning when creating a new record with a record identifier that matches one from another arm:

Records are assigned to an Arm when they are created and **it is not possible to later edit the arm to which a record is assigned**. There are ways to handle the need for a record to switch to another arm, however, depending on the reason why the switch is required.

Switching Arms: Correcting an Incorrect Arm Assignment

A switch of arm can be achieved indirectly via an export-import "shuffle":

1. Using the Data Export module perform the "Export all project data" task and download the data in **Raw CSV** format
2. Locate the data row (or rows) that relate to the record to be switched to a different arm. There will be more than one row if data exists for more than one event: rows are uniquely identified by the combination of record identifier (e.g. `study_id`) and event reference (e.g. `enrolment_arm_1`).
3. Delete all rows that correspond to other records
4. Correct the event reference, e.g. change `enrolment_arm_1` to `enrolment_arm_2`.
5. Save the file in CSV format. **Ensure that all dates remain in yyyy-mm-dd format and any leading zeros in numeric fields are preserved.** Excel can be unhelpful here: see Note on CSV Files.
6. Use the Data Import tool to re-import the record's data
7. View the newly imported record to ensure that the data has been imported as you expect
8. Delete the original record from the incorrect arm

To perform these tasks user(s) require Create Record and Delete Record permissions and permission to access the **Data Export** and **Data Import** modules. See User Rights.

Switching Arms: Progression Through Study

Projects where the arm is not known at the time a record is created should be set up with an arm specifically for the initial phase, as well as arms for any subsequent phase(s). Create the record in the initial arm, then later create a record in the appropriate subsequent arm with a record id that matches the record in the initial arm. REDCap warns you of the duplicate identifier, but in this case you expect to see this message: you have mistyped the identifier if you don't.

Refer to Arm Setup for Screening Phase and Randomised Phase for an example project with an enrolment phase, followed by a later randomisation.

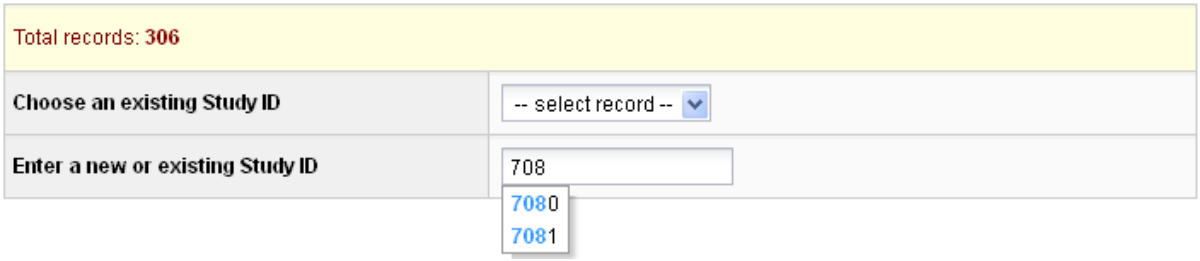
3.2.4 Select Existing Record

Select

Records can be selected either directly from the drop-down lists labelled **Incomplete**, **Unverified** and **Complete** or by typing the record identifier into the text entry box.

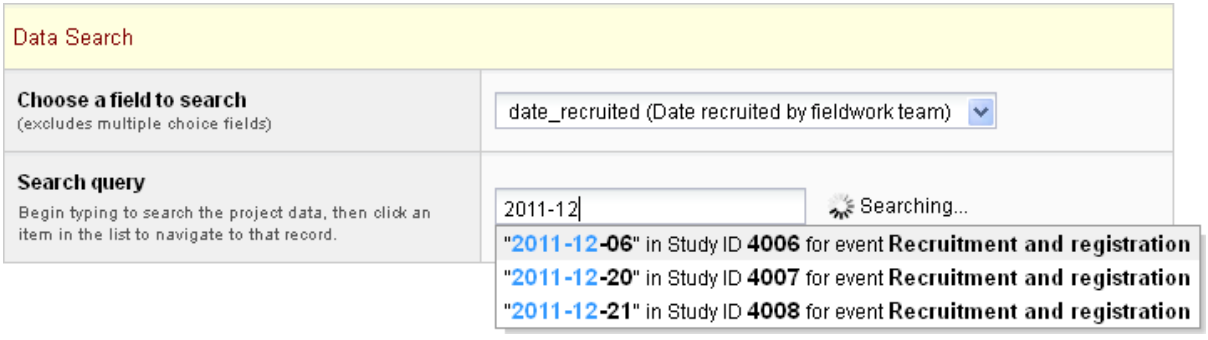
See Form Data entry for more on the Incomplete vs. Unverified vs. Complete form status indicators, but note here that records are assigned to these record selection check boxes according to the status of the **last** form. Not all forms need to be marked Complete in order for the record to appear in the Complete list.

With each keystroke of your typing, records with identifiers that match are shown in a list. Click a list item to select that record.



Search

The **Data Search** section of the record selection page enables you to search for records based on the value saved for the field you select. Only non-categorical fields appear in the list as they are most likely to contain useful identifiers.


Data Search
Choose a field to search
(excludes multiple choice fields)
date_recruited (Date recruited by fieldwork team)
Search query
Begin typing to search the project data, then click an item in the list to navigate to that record.
2011-12
Searching...
"2011-12-06" in Study ID 4006 for event Recruitment and registration
"2011-12-20" in Study ID 4007 for event Recruitment and registration
"2011-12-21" in Study ID 4008 for event Recruitment and registration

With each keystroke of your typing, records with saved data matching your entry are shown in a list. Click an item in the list to select that record.

When Record Selected

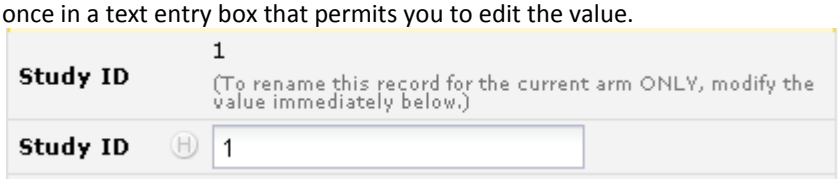
What you see next is determined by the project type and how the record was selected:

1. Search: selecting a record using the Data Search feature takes you directly to the event/form for the data item you selected
2. Add / Edit Records, non-longitudinal projects: you will see the first of your data entry forms
3. Add / Edit Records, longitudinal projects: you will see the Event Grid

3.2.5 Rename a Record

"Renaming" a record is amending the record identifier (e.g. `study_id` value). To rename:

1. Navigate to the first form (of the first event, if longitudinal)
2. You will see the record identifier field displayed twice: once as a display of the current value, and once in a text entry box that permits you to edit the value.



3. Edit the value and save the form (see Form Buttons)

You cannot change the record identifier to that of an existing record.

To rename records a user must have been given the necessary permission on the User Rights page. Access to this function should be restricted to a limited set of project users.

3.2.6 Delete Records

To delete a record:

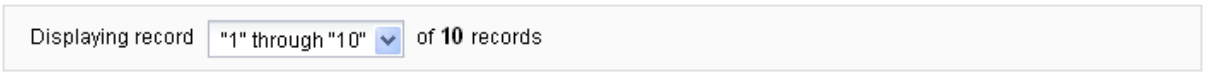
1. Navigating to any data entry form for the record
2. Click the **Delete Record** button that appears at the bottom of the form (see Form Buttons)
3. Confirm the deletion

Be careful: there is no 'Undo'.

To delete records a user must have been given the necessary permission on the User Rights page. Access to this function should be restricted to a limited set of project users.

3.3 Record Status Dashboard

The **Record Status Dashboard** gives an overview of the status of each form in each event for each record.



Study ID	Enrolment Details Enrolment (Arm 1: Arm 1)	Randomisation Randomisation (Arm 1: Arm 1)	Follow Up Follow Up 1 (Arm 1: Arm 1)	Follow Up Follow Up 2 (Arm 1: Arm 1)	Enrolment Details Enrolment (Arm 2: Arm 2)	Randomisation Randomisation (Arm 2: Arm 2)	Second Dose 2nd Dose (Arm 2: Arm 2)	Follow Up Follow Up (Arm 2: Arm 2)
1	●	●	●	●				
2					●	●	●	●
3	●	●	●	●				
4					●	●	●	●
5	●	●	●	●	●	●	●	●
6					●	●	●	●
7	●	●	●	●	●	●	●	●
8	●	●	●	●	●	●	●	●
9	●	●	●	●	●	●	●	●
10	●	●	●	●	●	●	●	●

The dashboard displays up to 100 records. When your project contains more than 100 records you can move between pages using the drop-down list.

The status of a form is indicated by a coloured icon:

- Incomplete
- Unverified
- Complete
- Partial Survey Response
- Completed Survey Response

See Form Status Indicator for more information on form status flags.

3.4 Survey Invitations: Invite Participants

Data Collection
Manage Survey Participants
- Get a public survey link or build a participant list for inviting respondents

The **Manage Survey Participants** link in the left-hand **Data Collection** menu takes you to the Invite Participants page, and options for providing access to your survey for your intended participants.

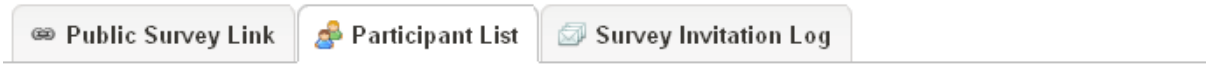
3.4.1 Public Survey Link

A public survey is a survey that is accessed via a single, generic URL. Records are created by responses to the survey so it is required that the first data collection instrument be enabled as a survey.

The generic, public survey URL can be included in emails, web pages or elsewhere. Respondents accessing this URL do so anonymously, so you may require each respondent to provide relevant details that can be used to identify them in any associated follow up.

There is the option to obtain a shorter, more easily typed link by clicking the **Get shorter survey link** link. The link generated, when accessed, will redirect the user's browser to the regular public survey URL.

3.4.2 Participant List



A powerful feature of REDCap surveys is the ability to define a list of participants. REDCap generates a survey URL that is unique to each member of the list, which enables you to track survey who is responding to your survey invitation – and who is not – without requiring that the survey form contain any identifying information.

Participant Identifier

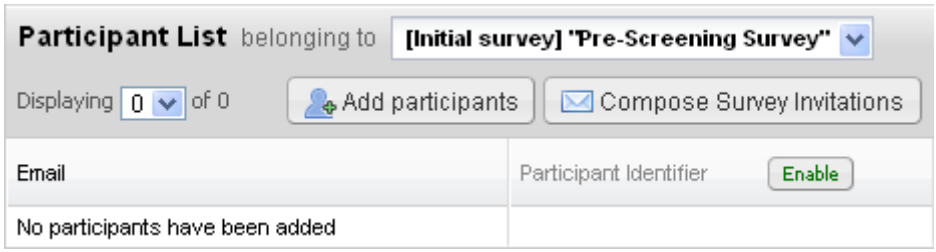
The ability to specify an identifier for each member of the participant list is optional. This means that you can choose a tracking model that best suits your project:

1. **No identifier:** the Participant List shows who has responded but there is no link from the participant to a specific response. **The responses remain anonymous**.

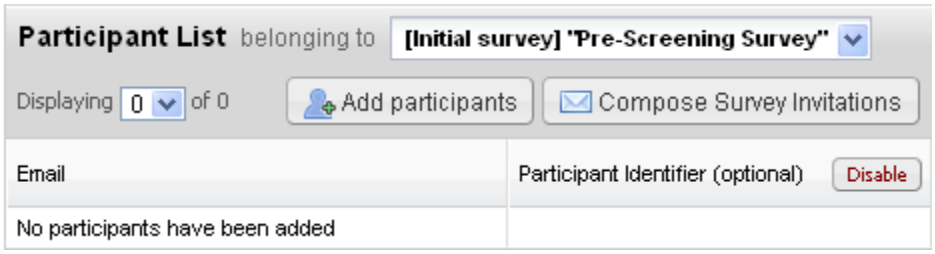
2. **With identifier:** the Participant List shows who has responded and you can navigate directly to the participant's response. but there is no link from the participant to a specific response. **The responses remain anonymous**.

This setting is available only when your project is in Development.

To enable participant identifiers click the **Enable** button.



Identifiers can be disabled by clicking **Disable**.

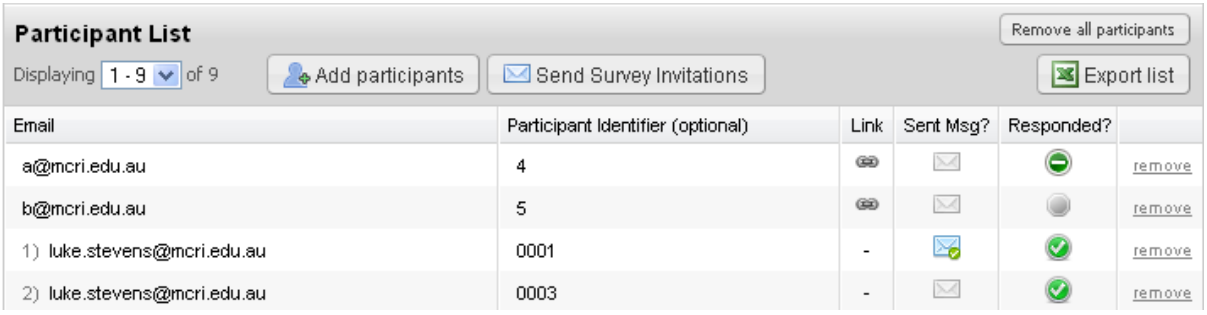


Add Participants

There are two options for populate your participant list:

1. Click **Add Participants** and enter (e.g. copy-and-paste) your list of email addresses (and identifiers, if enabled), one per line:
   `<email address>` email only, with no identifier
   `<email address>,<id>` comma-separated email,id when identifiers have been enabled

2. Designate an email field from your data collection forms . Email data entered into this field will be used to populate the Participant List automatically.

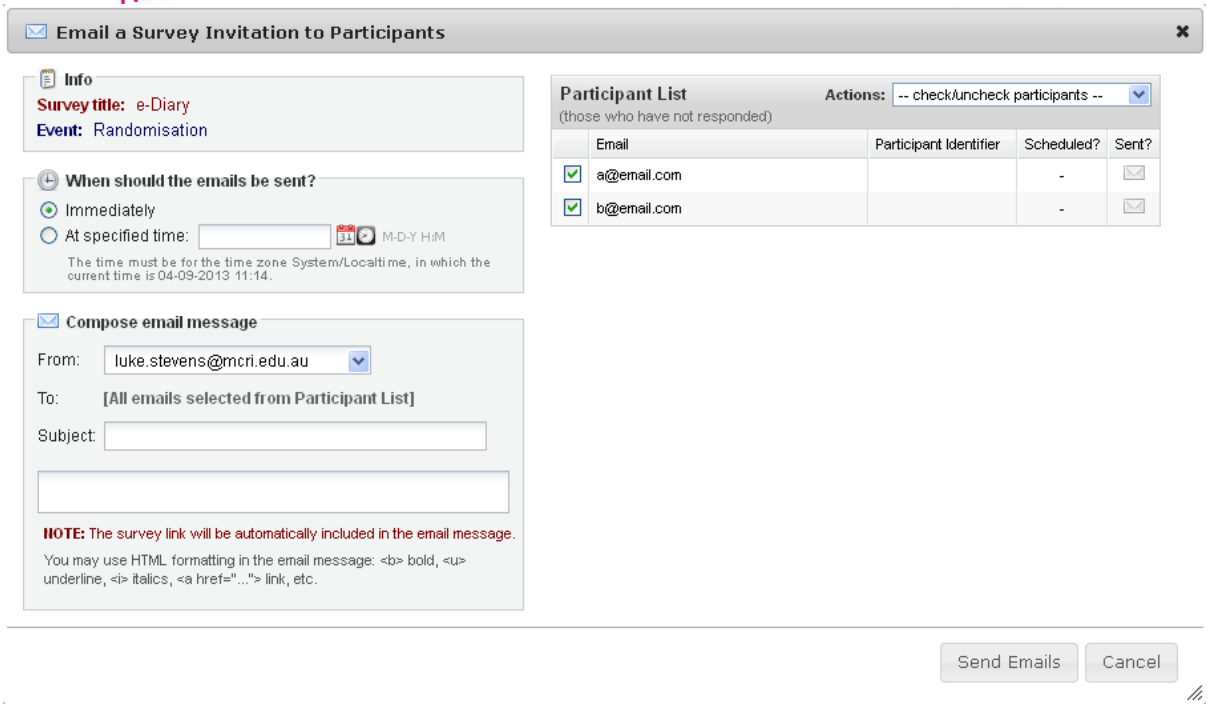


Note:

- Participant Identifier values must be unique
- Email addresses need not be unique. You may add your own (or a project) email address for all records, for example, if you wish to tailor each request to each specific participant and send the request email yourself

Send Survey Invitations

Clicking **Compose Survey Invitations** enables you to send email invitations to members of your participant list.



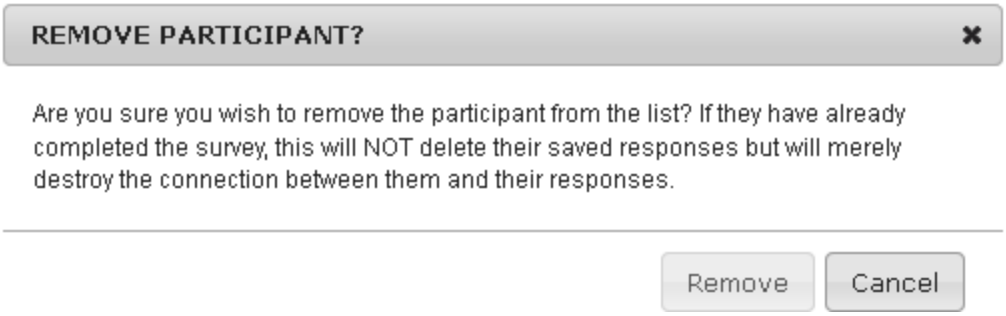
- Indicate whether the message(s) is(are) to be sent immediately or at a specified time
- Select the email address that you want the message(s) to be sent from. You can add additional email addresses to your REDCap account on the My Profile page. A verification process is enforced to ensure that you have access to all of the email account s.
- Set the message subject and body: the participant's unique URL will automatically appended to the message body
- Select the desired recipients by ticking the relevant checkbox. The Actions drop-down list gives you shortcuts to ticking:
    - Check All
    - Uncheck All
    - Check Sent
    - Check Not Sent
    - Check Scheduled
    - Check Not Scheduled
    - Check Not Scheduled and Not Sent
- There is no limit to the number of times an invitations may be sent and re-sent to a participant

Track Survey Responses

- A participant's unique URL is shown in your browser's status bar when you hover your mouse pointer over their link icon ( )
- Click the link icon ( ) to open the participant's survey form. You may complete and submit the survey yourself on behalf of the participant: if conducting their survey CATI-style (by telephone), for instance.

- With identifiers enabled you may click the response indicator icon (for a partial response, for a complete response) to view the response data.

- **Do not, never, under no circumstances** click **remove** (remove) for participants that have registered a response, either partial ( ) or complete ( ). You will lose the link between the survey response and the ID in the Participant List. **It is not recoverable.**


REMOVE PARTICIPANT?
Are you sure you wish to remove the participant from the list? If they have already completed the survey, this will NOT delete their saved responses but will merely destroy the connection between them and their responses.
Remove
Cancel

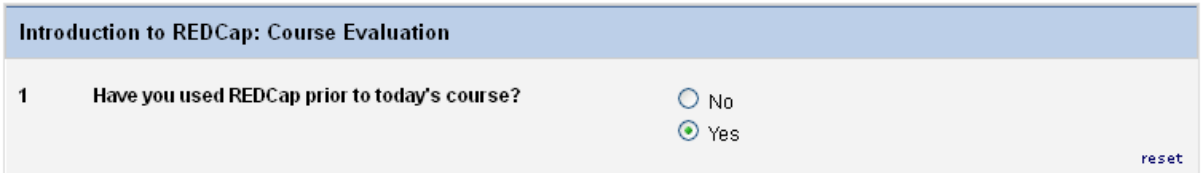
Never do this!

3.4.3 Pre-Populating Survey Fields

Survey fields can be pre-populated by including field name / value pairings in the survey URL. For example:

previous_redcap = 1

https://redcap.mcri.edu.au/surveys/?s=4QCRXf&previous_redcap=1

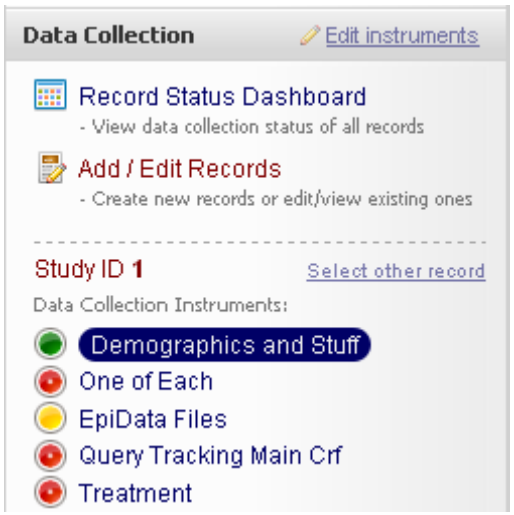


Contact the administrator for assistance, if required.

3.5 Navigation (Within Record)

The way you navigate between forms varies according to whether your project has longitudinal data collection enabled (see Longitudinal data collection).

Navigating Between Forms (Non-Longitudinal)



The **Demographics** form is selected for Study ID 1

To select **another form for this record** click, for the appropriate form:

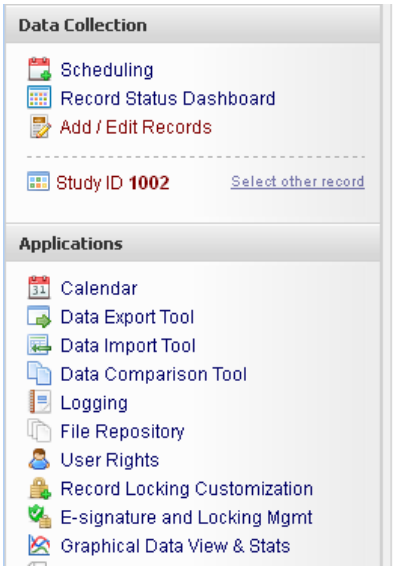
- The coloured form status indicator dot
- The form name

To select **another record** click:

- **Add / Edit Records**
- **Select other record**

Event Grid (Longitudinal)

The **Event Grid** displays a grid of events and forms for the selected record, here 1002, with the coloured form status indicator dots highlighting the current status of each data collection form (see Form Status Indicator for more information on form status).



Study ID **1002**

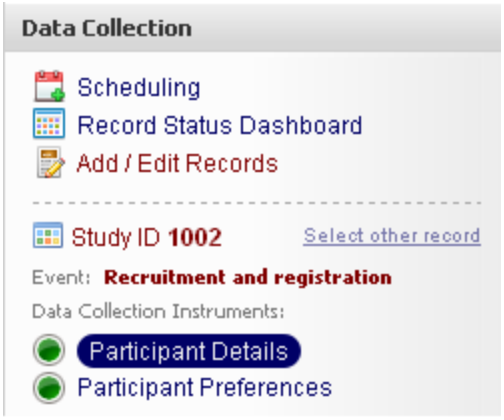
Data Collection Instrument	Events			
	Recruitment and registration (1)	Three month check-in (2)	Questionnaire and consent (3)	Study completion (4)
Participant Details	●			
Participant Preferences	●			
Three month check in		●		
Communication Pre And Post Interview			●	
Meeting Details			●	
Self Completion Option			●	
Informed Consent Documents			●	
Questionnaire Processing			●	
Gift Card Processsing			●	
Study Completion Information				●

View a form for the current record by clicking the appropriate form status indicator dot.

To select **another record** click, under **Data Collection**:

- **Add / Edit Records**
- **Select other record**

Navigating Between Forms Within an Event (Longitudinal)



Here the **Demographics** form of the **Recruitment and registration** event is selected for **Study ID 1002**

To select **another form in this event for this record** click, for the appropriate form:

- The coloured form status indicator dot
- The form name

To select **a form in another event for this record**:

- Return to the **Event Grid** by clicking the record identifier Study ID 1002
- Click **Cancel** on the current data entry form

To select **another record** click:

- **Add / Edit Records**
- **Select other record**

3.6 Form Data Entry

Entering Data

- Easy! Type values into text fields and use your pointing device (mouse, finger etc.) to make selections from drop-down list, radio group and check box group fields.

- Move between fields using your pointing device or the Tab key, although Tab currently does not set focus to checkbox groups in all browsers (use a modern browser!).

  It is not possible to use the Enter key to cause the focus to move to the next field in the way that EpiData does and Access can be configured to do. Such behaviour would be unexpected in a web interface where standard Enter key behaviour is to submit the form to the server.

- The date / date-time picker is displayed automatically for date / date-time fields unless switched off for the project (see Additional customizations).

- Branching logic expressions are evaluated when the focus leaves any field that is included in any branching logic expression on the form.

- Calculated fields are evaluated when the form opens and when the focus leaves any field that is included in a calculation expression. Note that this means **calculations are not performed on imported data**, until the form containing the calculated field is explicitly opened and then saved.

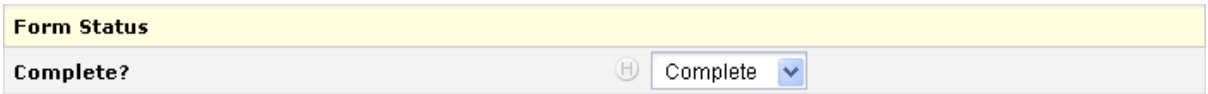
- All calculations are executed together, and the execution occurs **in alphabetical order**. This gives you a powerful ability to utilise in a calculated field the results of other calculations on fields on a form. You just need to ensure that the field name of any such calculation occurs alphabetically after all field names of calculated fields that it uses. This constraint does not apply to the field names of regular fields, only calculated fields.

Form Status Indicator

Each data entry form as a status indicator field containing three status settings:

1. Incomplete
2. Unverified
3. Complete

REDCap ascribes no particular significance to the status of a form, which means that you can use these status flags in any way that suits you. The wording of the label does not bind you to any specific meaning.



Form status is created automatically by REDCap as a real field in the project database in the following format:

`<form_name>_complete`

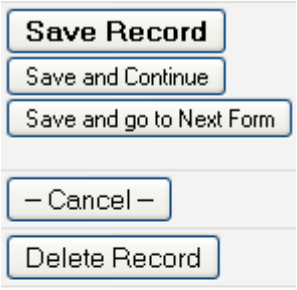
It therefore can be utilised just as any other field for data exports, reports and data imports.

When importing data into form status fields use the following values:

0 = Incomplete (equivalent to a blank value or omitting the column)
1 = Unverified
2 = Complete

Form Buttons

At the foot of every data collection form are a collection of buttons. Some or all of these may appear, according to your permissions set in User Rights.



Save Record:
Saves and closes the data entry form

- Non-longitudinal: return to the record selection page
- Longitudinal: return to the Event Grid.

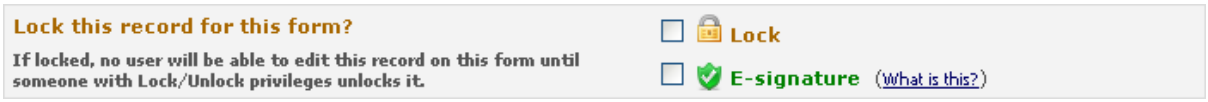
Save and Continue:
Saves the current state of the data entry form, but the view remains on the page.

Save and go to Next Form:
Saves and the form and opens the next form. Shown only when more than one form exists for the project (non-longitudinal) or for the current event (longitudinal).

Cancel:
Cancels all updates and closes the form: no changes are saved. View returns to record selection page for non-longitudinal projects or the Event Grid for longitudinal projects.

Delete Record:
Shown only to users with the appropriate permissions. Deletes the record.
Be careful: there is no 'Undo'!

Lock and E-signature


Lock this record for this form?
If locked, no user will be able to edit this record on this form until someone with Lock/Unlock privileges unlocks it.
Lock
E-signature
(What is this?)

The option to lock the current data entry form is displayed to users that have Lock/Unlock permission. A locked form cannot have any edits made.

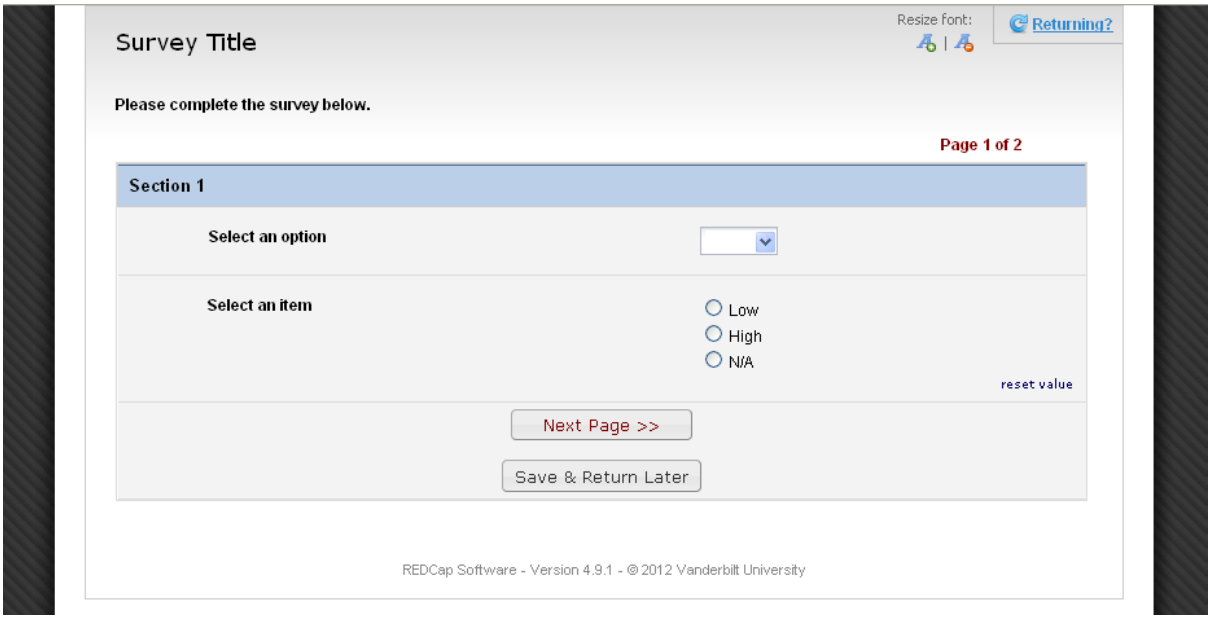
The E-signature option is displayed to users that have the e-signature permission on forms for which the e-signature option is enabled. The user enters their username and password to effect a signature.

See Record Locking Customisation and User Rights for more information.

3.7 Survey Data Entry

Survey Data Entry Form

Survey data entry pages appear as plain data entry forms without any extraneous display, such as menus. You can add your own project branding to survey pages: see Survey settings.

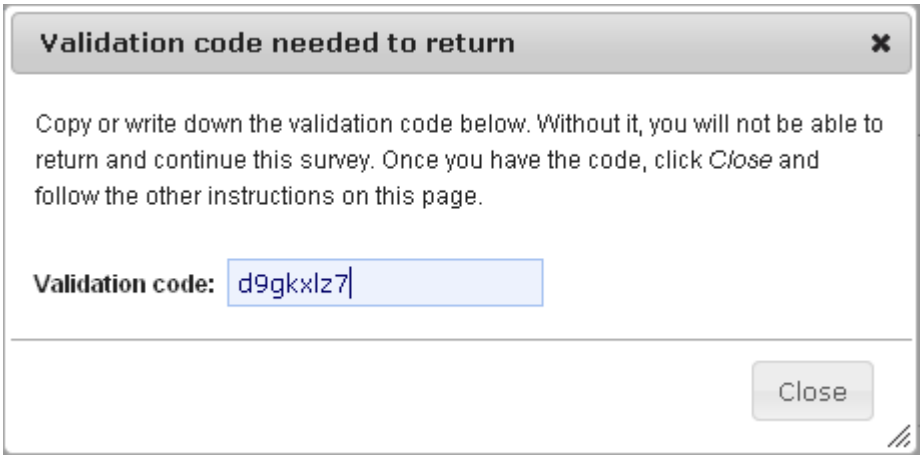


Note that for multi-page surveys, response data is saved as a partial response with each page transition.

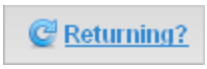
Save & Return Later

The option for respondents to save their current progress and return later to complete their response can be activated on the **Modify Survey Settings** page. See Survey settings.

An alphanumeric code is generated each time a survey is begun and this is displayed to the user when they select **Save & Return Later**


Validation code needed to return
Copy or write down the validation code below. Without it, you will not be able to return and continue this survey. Once you have the code, click Close and follow the other instructions on this page.
Validation code:
d9gkxlz7
Close

The respondent can bookmark the page, send themselves an email containing the return link or return to the original URL and click the **Returning?** button in the top-right corner of the screen.



The text &__return=1 is appended to the participant's URL.
E.g. https://redcap.mcri.edu.au/surveys/?s=f006ae&__return=1

The respondent is then given the option to restart the survey or continue where they left off by entering the code.

Return codes are generated and saved event if the respondent closes the survey (or there is a connection problem) without selecting **Save & Return Later**.

Forgotten, lost or unknown return codes can be retrieved by project users by accessing the relevant survey response. See Select Existing Record.

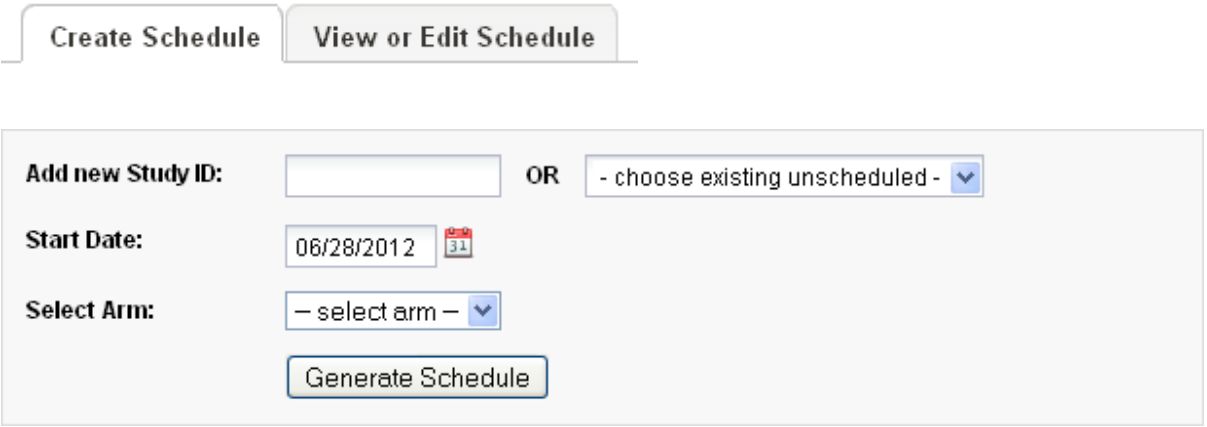
3.8 Scheduling

The **Scheduling** module is optional for longitudinal projects. It works in conjunction with the events you have created to enable you to generate an event schedule for each individual project record. Typically this is a calendar of a participant's study visits.

The scheduling module is accessed via the **Scheduling** button in the left-hand menu of any project page.

Create a Schedule

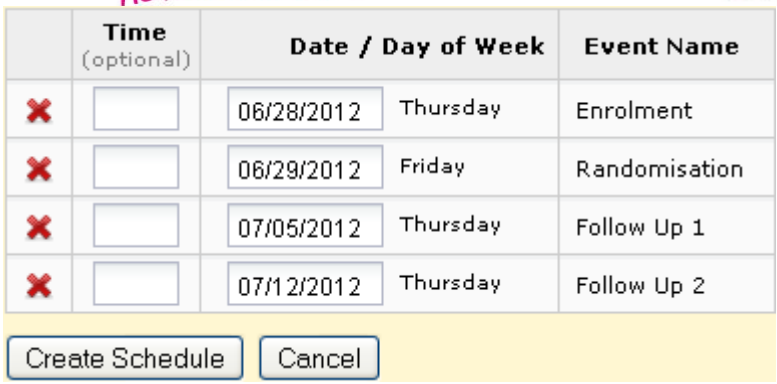
Create participant schedules on the **Create Schedule** tab.



Notes:

- You can create a new record here by entering a new record identifier in the text entry box: be sure to select the correct arm if your project has multiple arms (see Creating a New Record: Arms).
- Start Date is the baseline date for the schedule: the date from which each event's offset days is calculated.
- Currently it is not possible to alter the month/day/year format of the date display. Use the date picker ( ) to avoid confusion.
- Currently it is not possible to automate the generation of schedules or use a form field as the default start date.

A "projected schedule" is generated and displayed, allowing you to adjust event dates and times (avoiding weekend visits, for example). The schedule is not saved until you click **Create Schedule**.



	Time (optional)	Date / Day of Week	Event Name
✖		06/28/2012 Thursday	Enrolment
✖		06/29/2012 Friday	Randomisation
✖		07/05/2012 Thursday	Follow Up 1
✖		07/12/2012 Thursday	Follow Up 2

Create Schedule Cancel

View or Edit Schedule

Select the relevant record to view the associated schedule.

- Edit ( ): edit the date, time, status or notes for the schedule event
- Delete (✖): remove the schedule event. **Be careful: there is no 'Undo'!**
- View ( ): Open the schedule event in a dialog box. Also permits editing.

Do not delete event records unless you really mean to!

Schedule events across all records in your project may be viewed in a calendar format using the Calendar module.

3.9 Double Data Entry

Double data entry is a tried and tested strategy for validating data entered manually. Ideally all records would be entered twice by different data entry persons, but if this is not practical, double entry and checking of just a sample can be a worthwhile compromise.

REDCap contains specific functionality for managing double data entry, but there is a requirement that specific users are allocated to entry roles 1 and 2. This is often too restrictive for projects that have several data entry staff that might fulfil different roles at different times.

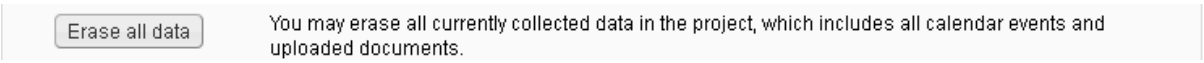
The recommended method is for each record to be entered as normal once, then for a duplicate record to be entered as a new record but with a suffix appended to the record identifier, for example:

```
study_id
1001
1002
1003
...
1001-duplicate
1002-duplicate
1003-duplicate
...
```

Validation of the data entry is performed using the Data Comparison Tool (and source data e.g. paper CRF). Each pair of records is viewed in the tool, which highlights any instances where a field value differs between the pair. Data can be corrected and the "-duplicate" records dropped from data exports prior to analysis.

3.10 Deleting Test Data

At any stage during the development phase of a project you can delete all test data (records, survey responses, schedules) using the **Erase all data** button on the Other Functionality page.


Erase all data
You may erase all currently collected data in the project, which includes all calendar events and uploaded documents.

4 Applications

REDCap's Applications may also be referred to as "Modules".

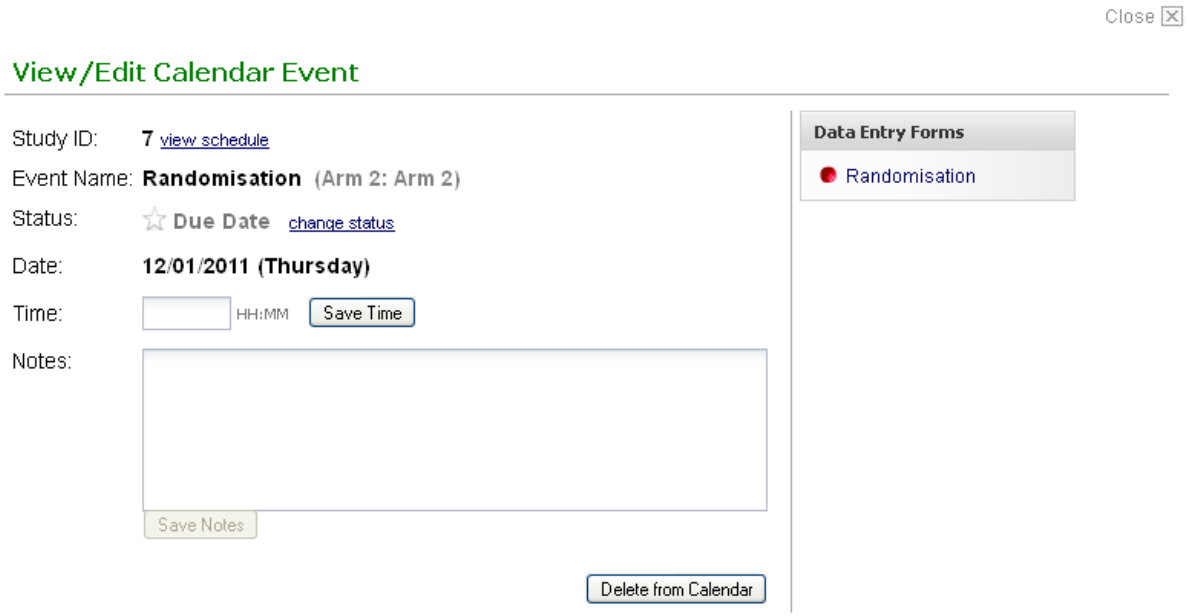
4.1 Calendar

The **Calendar** module integrates with REDCap's scheduling functionality to provide a calendar-based view of participant events.

- Select the **Day**, **Week** or **Month** to view the events for that period
- **Agenda** shows a list of the events for the period in date order
- The **+ New** button will add a new ad-hoc event to the calendar but you cannot associate data entry forms with ad-hoc events

4.1.1 Calendar Events

- Click on an event to view and make edits to the calendar event



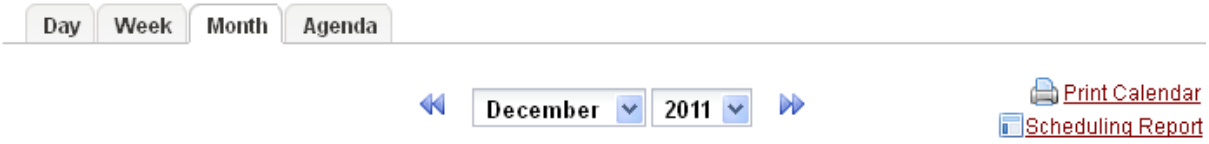
- Note the link to the data entry forms that are associated with the study event. Click the link to go to the form for data entry.

- The **Event Status** field has five settings:
  1. Due Date
  2. Scheduled
  3. Confirmed
  4. Cancelled
  5. No Show

  The coloured event status indicator changes (as shown) according to the status of the event.

  REDCap ascribes no particular significance to the status of an event, which means that you can use these status flags in any way that suits you. The wording of the label does not bind you to any specific meaning.

4.1.2 Scheduling Report



The **Scheduling Report** is an MCRI customisation that enables you to view and download (in CSV format) a report showing details of each event in the period selected on the **Calendar** screen.

To run a Scheduling Report click the **Scheduling Report** button to the top-right of the calendar.

The **Scheduling Report** can also include fields from your data entry forms. You might, for example, want to include participant name and contact details in the report to assist the project team in contacting participants that are due to attend their next study visit during the next week.

Contact the administrator with the field names you would like included in the **Scheduling Report**.

Close
Print page
Download report as: Microsoft Excel (CSV) XML

Staying Fit Scheduling Report

Date	Time	Event	Status	Record	Notes	Baseline	Baseline Visit Date (a1visdat)	EXIT CODE (exitcode)
2011-12-08		Session 1	Due Date	20011		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-08		Session 1	Due Date	20012		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-08		Parents Baseline Measurement	Due Date	20018		2011-12-08		
2011-12-15		Session 2	Due Date	20011		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-15		Session 2	Due Date	20012		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-22		Session 3	Due Date	20011		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-22		Session 3	Due Date	20012		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-29		Session 4	Due Date	20011		2011-12-08	2011-12-08	eligible- randomised & participating
2011-12-29		Session 4	Due Date	20012		2011-12-08	2011-12-08	eligible- randomised & participating

4.2 Data Export Tool

Use the Data Export tool to download your project data in a variety of formats. This module is scheduled to be upgraded and merged with the Report Builder during 2012.

4.2.1 Export Type

The initial **Data Export** page displays three options:

1. **Simple Data Export** for a one-click download of all data in the project
2. **Advanced Data Export** for selecting a subset of fields to download and selecting de-identification options
3. **Other Export Options** for a download of all data entry forms, with data, in PDF format

4.2.2 Advanced Export

The advanced data export option enables you to select specific fields to include in the export, including shortcuts for:

- Select / Deselect all fields from all forms
- Select / Deselect all fields from a specific forms
- Select / Deselect an individual field

Currently it is not possible to filter records: the exported dataset will contain all records that have data saved for any fields selected.

4.2.3 De-Identification

The de-identification options shown are pretty self-explanatory. In summary:

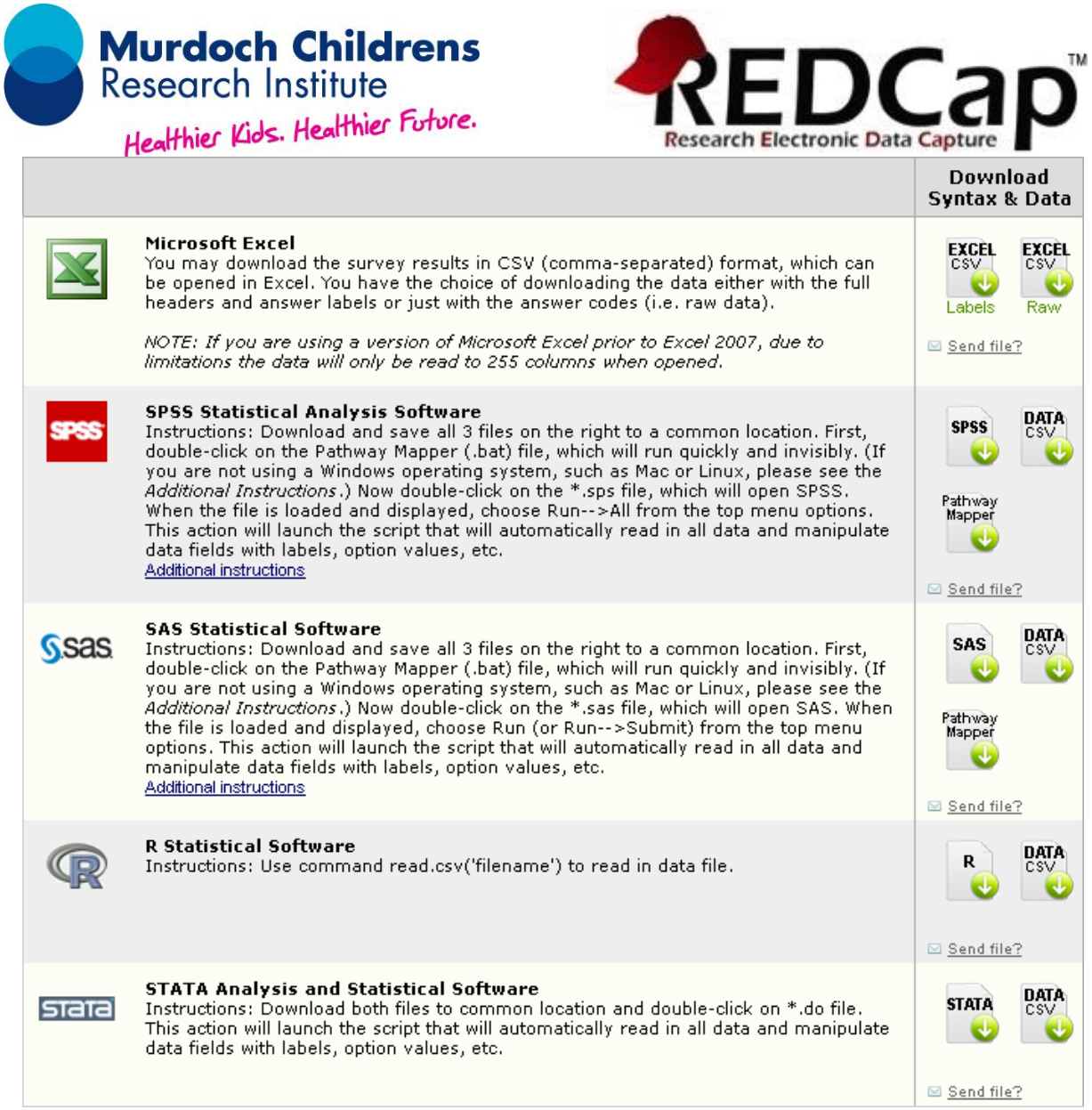
- Known identifiers: obfuscate record identifiers and/or ensure all fields that are flagged as identifiers in the online designer or data dictionary are excluded from the export
- Free-form text: text entry fields with no validation (and particularly Notes-type fields) can have identifying information entered into them. You can opt to exclude such fields from the export
- Date and datetime fields: can be excluded or date-shifted whereby all dates for each record are shifted by a random but consistent number of days (record 1 dates all +23 days, record 2 dates all +201 days etc.)

For users whose export permissions are set to **De-identified only** (see User Rights) these options (with the exception of record identifier hashing) are always on.

4.2.4 Export Formats

Note the reminder to cite your use of REDCap in any published material. See http://www.project-redcap.org/cite.php for some boilerplate text.

After the export is run and you have confirmed the citation reminder you are presented with your download options:


Murdoch Childrens Research Institute
Healthier Kids. Healthier Future.
REDCap™
Research Electronic Data Capture
Download Syntax & Data
Microsoft Excel
You may download the survey results in CSV (comma-separated) format, which can be opened in Excel. You have the choice of downloading the data either with the full headers and answer labels or just with the answer codes (i.e. raw data).
NOTE: If you are using a version of Microsoft Excel prior to Excel 2007, due to limitations the data will only be read to 255 columns when opened.
EXCEL CSV Labels
EXCEL CSV Raw
Send file?
SPSS Statistical Analysis Software
Instructions: Download and save all 3 files on the right to a common location. First, double-click on the Pathway Mapper (.bat) file, which will run quickly and invisibly. (If you are not using a Windows operating system, such as Mac or Linux, please see the Additional Instructions.) Now double-click on the *.sps file, which will open SPSS. When the file is loaded and displayed, choose Run-->All from the top menu options. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc.
Additional instructions
SPSS
DATA CSV
Pathway Mapper
Send file?
SAS Statistical Software
Instructions: Download and save all 3 files on the right to a common location. First, double-click on the Pathway Mapper (.bat) file, which will run quickly and invisibly. (If you are not using a Windows operating system, such as Mac or Linux, please see the Additional Instructions.) Now double-click on the *.sas file, which will open SAS. When the file is loaded and displayed, choose Run (or Run-->Submit) from the top menu options. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc.
Additional instructions
SAS
DATA CSV
Pathway Mapper
Send file?
R Statistical Software
Instructions: Use command read.csv('filename') to read in data file.
R
DATA CSV
Send file?
STATA Analysis and Statistical Software
Instructions: Download both files to common location and double-click on *.do file. This action will launch the script that will automatically read in all data and manipulate data fields with labels, option values, etc.
STATA
DATA CSV
Send file?

Notes:

- The data in the Excel CSV Raw and stats package DATA CSV files are identical – raw, unlabelled data in CSV format – but the stats package DATA CSV files do not contain header rows (field information is included in the syntax files)

- The **Pathway Mapper** files for SPSS and SAS are Windows batch files. When you have downloaded the associated syntax and data files, you can run (double-click) the pathway mapper. It will update the syntax file's file handle/infile statement so that it includes the full file path to the location where the files are saved.

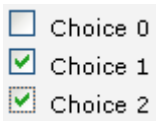
  Using the **Pathway Mapper** is optional (and not possible if you use Mac or Linux). You can perform the same task by manually setting the path in the syntax file, or by setting the current working directory to the appropriate location.

- **Send file?** loads the export files into REDCap's Send-It application, enabling you to send the files securely to anyone

- All exports are saved to the database and can be downloaded again using the File Repository

4.2.5 Export of Checkbox Fields

Checkbox groups are exported as separate fields named according to the field name plus a zero-based index. Below illustrates the export of a checkbox field named `checkboxquestion` that has three checkboxes. The first checkbox is unticked (value=0); checkboxes two and three are ticked (value=1).



X	Y	Z
checkboxquestion___0	checkboxquestion___1	checkboxquestion___2
0	1	1

4.2.6 Data Model for Longitudinal Projects

With longitudinal projects you will find that your exported data contains multiple rows per project record: one row per record per event for which data is exported, as illustrated below:

	A	B	C	D	E
1	study_id	redcap_event_name	dob	randomisation_date	follow_up_date
2	1	Enrolment (Arm 1: Arm 1)	30-10-2001		
3	1	Randomisation (Arm 1: Arm 1)		01-02-2012	
4	1	Follow Up 1 (Arm 1: Arm 1)			14-02-2012
5	1	Follow Up 2 (Arm 1: Arm 1)			19-02-2012

It is done this way to handle situations where a field occurs on a form used in more than one event, such as `follow_up_date` in the illustration above.

For your analyses you will typically need to manipulate the data so that it has all data for a record in a single row. Your stats package will have tools for accomplishing this kind of task (e.g. `reshape` in Stata).

After reshaping, the data above will appear like this:

J	K	L	M	N
study_id	dob	randomisation_date	follow_up_1_date	follow_up_2_date
1	30-10-2001	01-02-2012	14-02-2012	19-02-2012

See Data Model for more discussion of REDCap's internal data model.

4.3 Data Import Tool

The **Data Import Tool** page gives instructions on how to import data into your project.

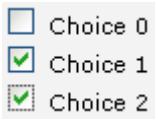
4.3.1 Import Template

First download an import template file (CSV format). The template contains column headings labelled with the field names from your data dictionary plus the form status indicator fields. Your template can be formatted with records in rows or records in columns. "Records in rows" is overwhelmingly more common.

4.3.2 Importing to Checkbox Fields

Checkbox groups are treated as separate fields named according to the field name specified plus a zero-based index. Below illustrates the import template for a checkbox field named `checkboxquestion` that has three checkboxes. Following import, the first checkbox will be unticked (value=0) and checkboxes two and three will be ticked (value=1).

X	Y	Z
checkboxquestion___0	checkboxquestion___1	checkboxquestion___2
0	1	1



4.3.3 Importing to Date and DateTime Fields

Date values must be formatted as yyyy-mm-dd

Date/time values must be formatted as yyyy-mm-dd HH:MM[:SS]

These are ISO standard formats and unambiguous, unlike dd/mm/yyyy and mm/dd/yyyy.

D	E
dob	enrol_date_time
2001-10-30	2011-12-14 12:30

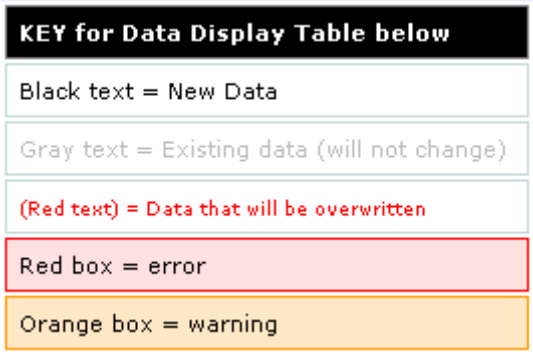
4.3.4 Upload File

Browse to your import file and click **Upload**.

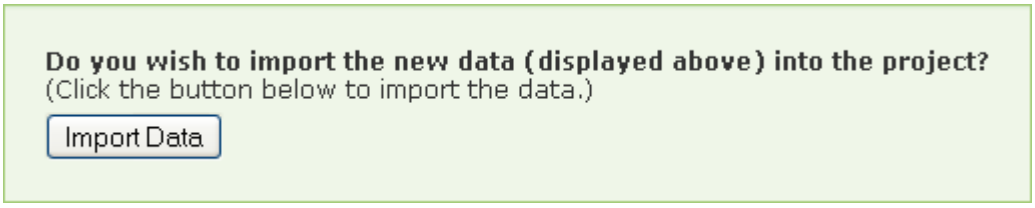
4.3.5 Upload Summary

REDCap does not import the data from the file directly. First it parses your file and displays a summary view. The summary view highlights what will be done with each data point in your import file.

Note: data can be imported into your project to create or update records. You cannot delete data using the Data Import Tool: **blank values in an import file will not overwrite existing data values**.



When you have reviewed the summary page, complete the import and commit the data to the database by clicking **Import Data** (**Submit Event** for longitudinal projects).



4.3.6 Importing Data for Longitudinal Projects

When importing data into a longitudinal project, you must include a column that specifies the unique event name for each record. Find the values to use on the **Define My Events** page from **Project Setup** (see Define My Events).

A	B	C	D	E	F	G	H
study_id	redcap_event_name	redcap_data_access_group	dob	enrol_date_time	enrolment_details_complete	allocation	randomisation_date
1	enrolment_arm_1	melbourne	2001-10-30	2011-12-14 12:30	2		
1	randomisation_arm_1	melbourne				1	2012-02-01
1	follow_up_1_arm_1	melbourne					
1	follow_up_2_arm_1	melbourne					
2	enrolment_arm_2	melbourne	1994-09-15	2011-12-14 10:30	2		
3	enrolment_arm_1	melbourne	1995-12-06	2011-12-15 14:00	2		
4	enrolment_arm_2	melbourne			0		
5	enrolment_arm_1	sydney	2005-03-10	2011-12-14 15:45	2		
5	randomisation_arm_1	sydney					
5	enrolment_arm_2	sydney			0		

4.3.7 Importing Data for Data Access Groups

When importing data into project that utilise Data Access Groups, you must include a column that specifies the Data Access Group (DAG) for each record. Find the values to use on the **Data Access Groups** tab from User Rights.

A	B	C	D	E	F	G	H
study_id	redcap_event_name	redcap_data_access_group	dob	enrol_date_time	enrolment_details_complete	allocation	randomisation_date
1	enrolment_arm_1	melbourne	2001-10-30	2011-12-14 12:30	2		
1	randomisation_arm_1	melbourne				1	2012-02-01
1	follow_up_1_arm_1	melbourne					
1	follow_up_2_arm_1	melbourne					
2	enrolment_arm_2	melbourne	1994-09-15	2011-12-14 10:30	2		
3	enrolment_arm_1	melbourne	1995-12-06	2011-12-15 14:00	2		
4	enrolment_arm_2	melbourne			0		
5	enrolment_arm_1	sydney	2005-03-10	2011-12-14 15:45	2		
5	randomisation_arm_1	sydney					
5	enrolment_arm_2	sydney			0		

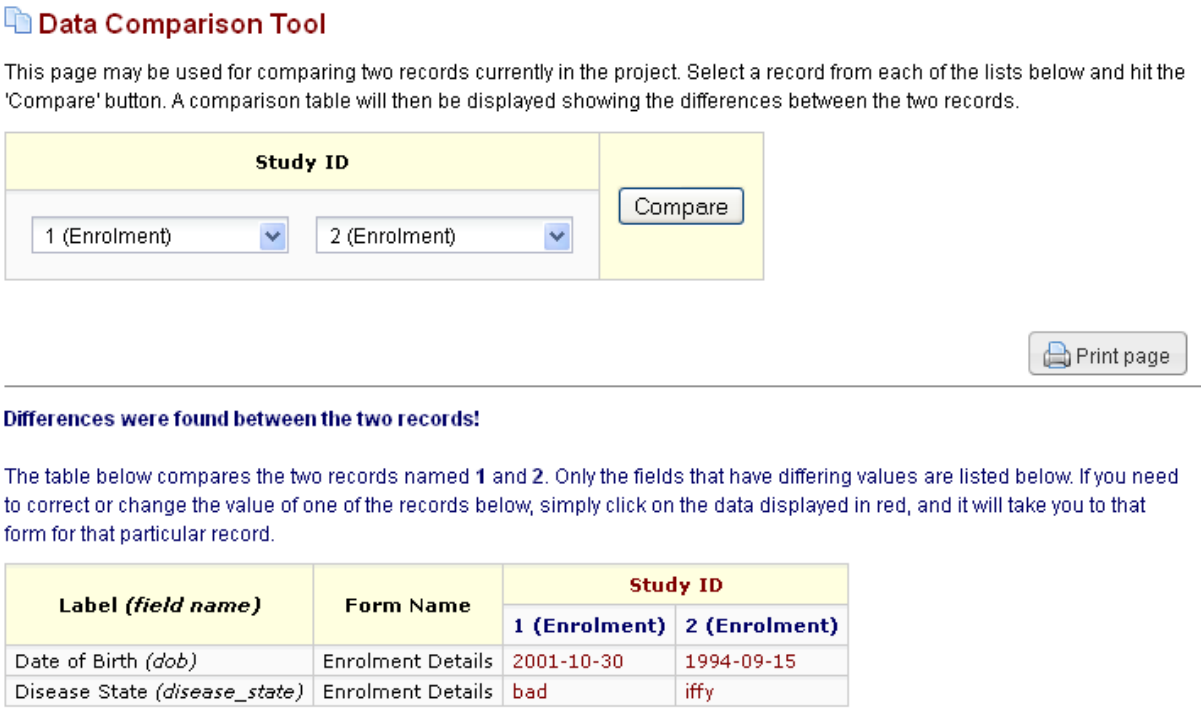
Where the user performing the import is assigned to a DAG, records are automatically assigned to the user's DAG. Such users cannot import records to other DAGs.

Records can also be assigned and re-assigned to a Data Access Group individually from their data entry forms following import.

4.4 Data Comparison Tool

The Data Comparison Tool enables you to select two records (including the event, for longitudinal projects) to compare any data side-by-side. Fields are highlighted where data values differ between the two records.

See also Double Data Entry.



Data Comparison Tool

This page may be used for comparing two records currently in the project. Select a record from each of the lists below and hit the 'Compare' button. A comparison table will then be displayed showing the differences between the two records.

Study ID

1 (Enrolment) 2 (Enrolment) Compare

Print page

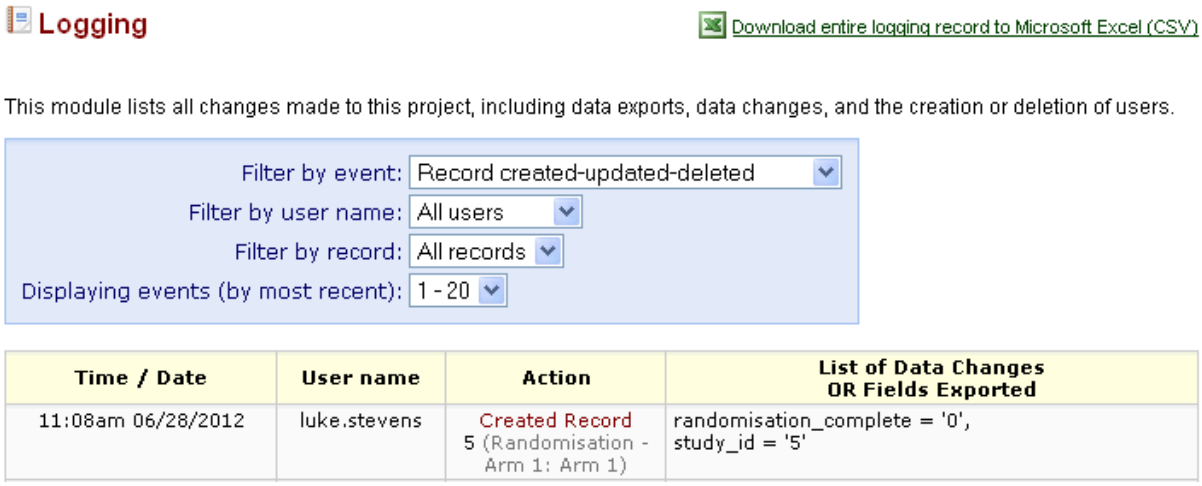
Differences were found between the two records!

The table below compares the two records named **1** and **2**. Only the fields that have differing values are listed below. If you need to correct or change the value of one of the records below, simply click on the data displayed in red, and it will take you to that form for that particular record.

Label *(field name)*	Form Name	Study ID	
		1 (Enrolment)	2 (Enrolment)
Date of Birth *(dob)*	Enrolment Details	2001-10-30	1994-09-15
Disease State *(disease_state)*	Enrolment Details	bad	iffy

4.5 Logging

The **Logging** module is where you can view audit trail information, i.e. a log of data changes in your project. You can view and reconstruct a history of record creations, updates and deletions and review the activity of your project's users.


Logging
Download entire logging record to Microsoft Excel (CSV)
This module lists all changes made to this project, including data exports, data changes, and the creation or deletion of users.
Filter by event: Record created-updated-deleted
Filter by user name: All users
Filter by record: All records
Displaying events (by most recent): 1 - 20
Time / Date
User name
Action
List of Data Changes OR Fields Exported
11:08am 06/28/2012
luke.stevens
Created Record 5 (Randomisation - Arm 1: Arm 1)
randomisation_complete = '0', study_id = '5'

Notes:

- Note the different filter options to help you narrow the scope of log records included in the view
- You may **Download the entire logging record**, just be aware that this may take a little time for large and mature projects.
- Unfortunately it is currently not possible to change the month/day/year date format

4.6 File Repository

The **File Repository** is not a document management system, but can be a useful and convenient place for storing and sharing project files.

4.6.1 User Files

The **User Files** menu tab is where you view all files that have been uploaded for a project.

Notes:

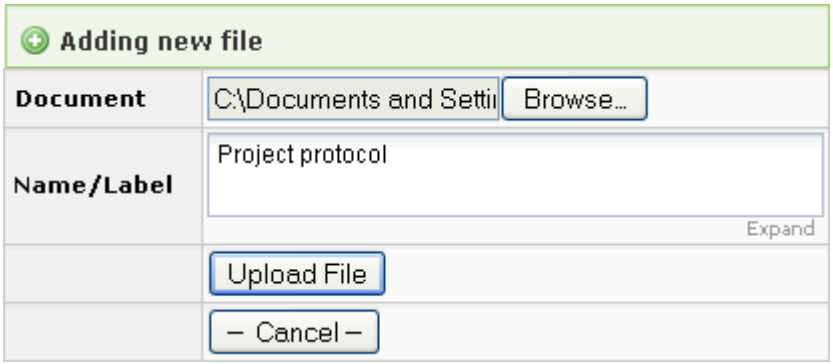
- The four **Actions** are:
  - Download file
  - Edit label
  - Remove file
  - Send the file to anyone using Send-It
- All files will be visible to and all actions can be performed by any user that is given access to the **File Repository** module.

4.6.2 Data Export Files

The **Data Export Files** menu tab gives users with Data Export permissions access to the history of data exports.

4.6.3 Upload New File

Uploading a new file is very straightforward: select the **Upload New File** menu tab, select the file to upload and give it a label, then click **Upload File**.



4.7 User Rights

4.7.1 Creating Users

All REDCap users must obtain their own individual REDCap user account. The REDCap System Administrator will create new user accounts upon request.

External (Non-MCRI) Users

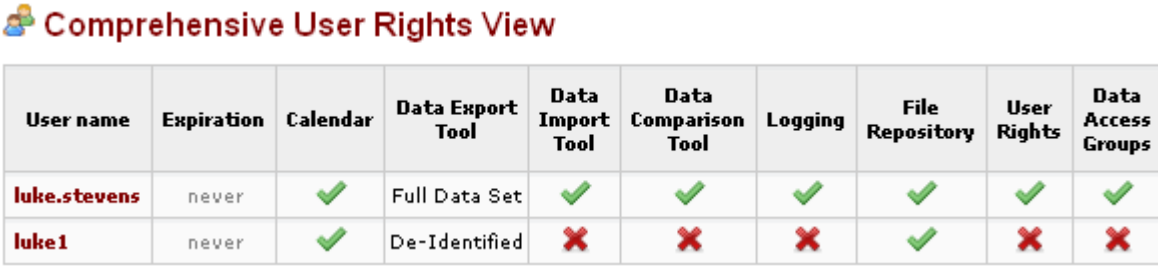
Accounts can be created for anybody – for RCH staff and external collaborators, as well as for Murdoch Childrens staff – but note that the ability to create new projects is restricted to users that hold a Murdoch Childrens appointment.

4.7.2 Add a New Project User

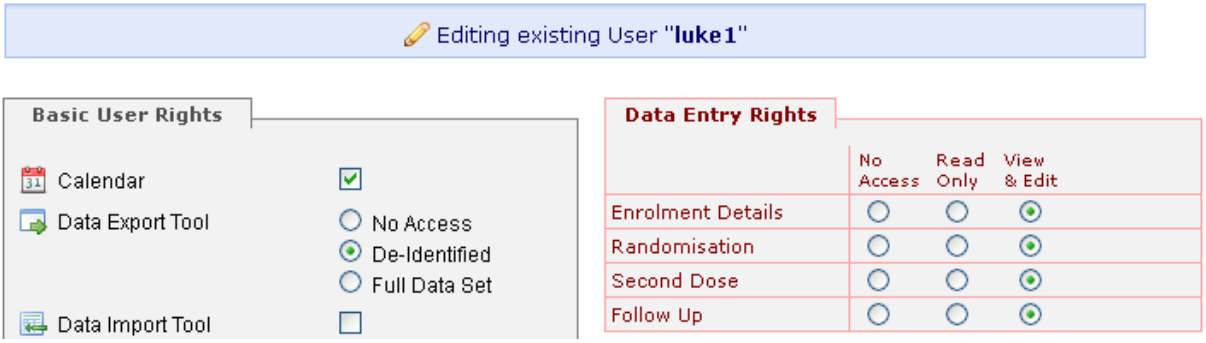
To add a new user to your project, simply enter their REDCap username into the text entry box on the **User Rights** page.

4.7.3 Edit User Permissions

The **User Rights** page displays a summary of the current permissions for your project users.



To edit a user's permissions, click on their user name. The **Edit User** page opens.



The **Basic User Rights** section is a checklist of REDCap modules that the user can access.

- In general, users should be given access only to the modules that they require, and no more. This is known as the Principle of least privilege and acts both to increase the security of your project and to aid usability by removing unnecessary clutter from a user's view.

- Note the **Expiry Date** field gives you the option of permitting access for a specific period of time

The **Data Entry Rights** section is self-explanatory.

- The Principle of least privilege applies here too

At the bottom of the page are three buttons:

- **Save Changes**
- **Cancel**
- **Delete User**

4.7.4 Data Access Groups

The configuration of project Data Access Groups is performed on the **Data Access Groups** menu tab, which includes instructions for creating DAGs and assigning users.

Create a Data Access Groups

Enter the name of the new group into the text box and click **Add Group**.

Data Access Groups	Users in group	Number of records in group	Unique group name (auto-generated)	Delete group?
Melbourne	luke1	0	melbourne	✖
Sydney		0	sydney	✖
[Not assigned to a group]	luke.stevens * Can view ALL records	10		

Type new group name | Add Group

The new group will be added to the table. The table also indicates the users that are assigned to each group and the **Unique group name** used in data imports and exports.

Rename a Data Access Group

Rename a Data Access Group by clicking its name in the table. Click or tab away from the field and the new name is saved automatically.

Data Access Groups
Melbourne

Delete a Data Access Group

Click **x** to delete a group.

You must remove all users from the Data Access Group before it can be deleted.

Assign User to a Data Access Group

Select the user and group and click **Assign**. The user will be assigned (or re-assigned) to the group.

Note that it is not possible for a user to belong to more than one Data Access Group.

Remove User from a Data Access Group

Select the user, then select [No Assignment] as the group. Click **Assign** and the user will be removed from all Data Access Groups.

4.8 Customization Module for E-signatures and Record Locking Functionality

Record locking and e-signatures are optional features that can help you gain greater control over the status of the data in your project.

Records that are **locked** cannot be updated unless the lock is first removed by a user with record Lock/Unlock permissions.

Locked records can be **electronically signed**. A signature becomes invalid the record is later unlocked.

The **Customization Module** enables configuration of your preferences for locking and e-signatures. By default they are switched off, but you can enable locking and/or e-signatures for specific forms.

Display the Lock option for this instrument?	Data Collection Instrument	Also display E-signature option on instrument?	Lock Record Custom Text	Edit / Remove Custom Text
☑	Enrolment Details	☐	Save	

See Lock and E-signature for locking and signing a record.

4.9 E-signature and Locking Management

The **E-signature and Locking Management** page gives you various views over the Lock/Sign status of your data entry forms.

Download the table below as Microsoft Excel (CSV)

Actions: SHOW ALL ROWS | Show timestamp / user | Hide timestamp / user | Show locked | Show not locked | Show e-signed | Show not e-signed (excludes N/A) | Show both locked and e-signed | Show neither locked nor e-signed (excludes N/A) | Show locked but not e-signed (excludes N/A)

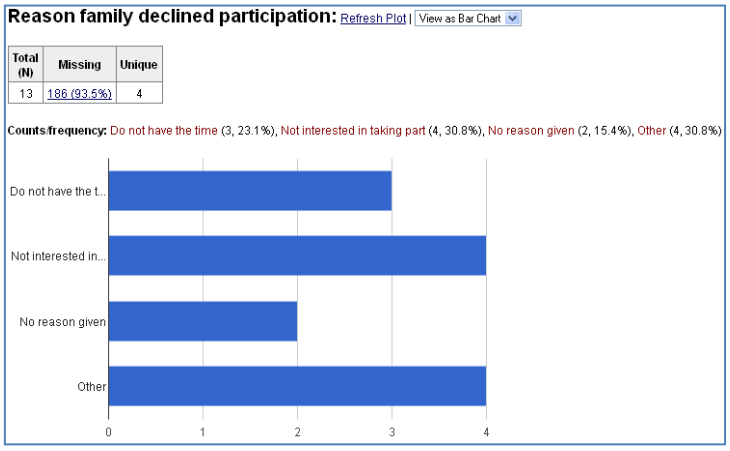
All Records					
Record	**Event Name**	**Form Name**	**Locked?**	**E-signed?**	
1	Enrolment	Enrolment Details	🔒	✔	View record
1	Randomisation	Randomisation	🔒		View record

4.10 Graphical Data View & Descriptive Stats

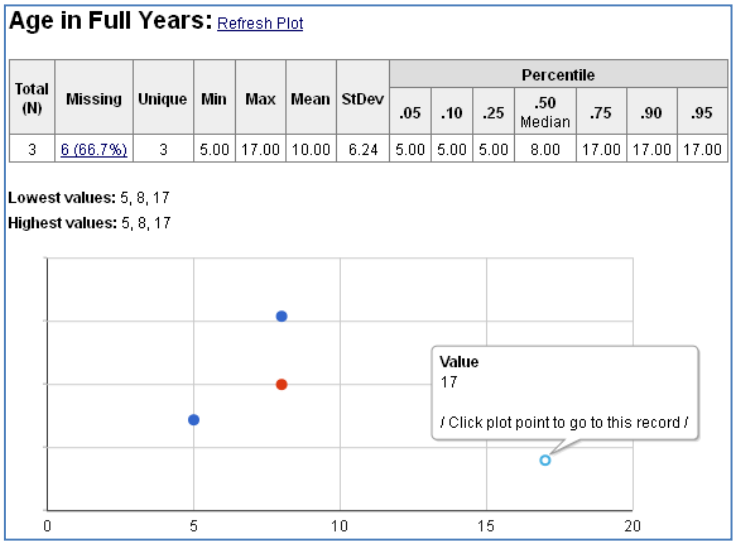
The **Graphical View & Stats** page provides simple summary views of your project data on a field-by-field basis. It does not enable you to define your own summaries, such as tabulations of two fields.

How the summary data is presented varies according to the field type:

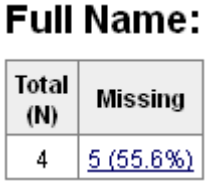
- **Categorical fields**: summarised in bar charts


Reason family declined participation: Refresh Plot | View as Bar Chart
Total (N) | Missing | Unique
13 | 186 (93.5%) | 4
Counts/frequency: Do not have the time (3, 23.1%), Not interested in taking part (4, 30.8%), No reason given (2, 15.4%), Other (4, 30.8%)
Do not have the t...
Not interested in...
No reason given
Other
0
1
2
3
4

- **Numeric fields**: summarised in scatter plots. This can be of assistance in identifying outliers. Click on a data point to navigate to the specific record.


Age in Full Years: Refresh Plot
Total (N) | Missing | Unique | Min | Max | Mean | StDev | Percentile | .05 | .10 | .25 | .50 Median | .75 | .90 | .95
3 | 6 (66.7%) | 3 | 5.00 | 17.00 | 10.00 | 6.24 | 5.00 | 5.00 | 5.00 | 8.00 | 17.00 | 17.00 | 17.00
Lowest values: 5, 8, 17
Highest values: 5, 8, 17
Value
17
/ Click plot point to go to this record /
0
5
10
15
20

- **Text fields**: you see simple totals for the number of records that have data and the number of records where the value is missing



4.11 Data Quality

The **Data Quality** module enables you to run tests on your project data to check for discrepancies. There are some "rules" that are included by default in each project; you may also create your own.

A "data quality rule" is a calculation expression that must evaluate to True or False. When a rule is executed on your project data any records for which the expression evaluates False can be viewed and potentially corrected.

The **Data Quality** page includes detailed instructions.

4.11.1 Execute Rules

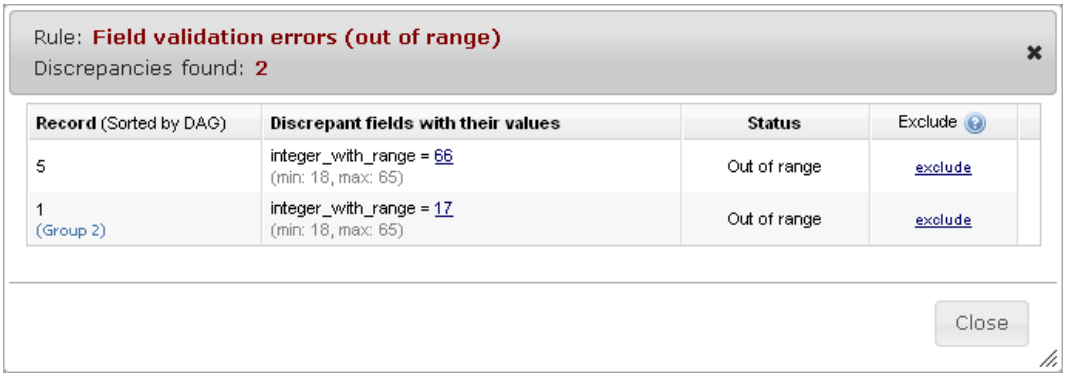
Execute rules one at a time using **Execute**, or all together using **Execute All Rules**.

The **Clear** button refreshes the view to the state before any rules have been executed.

4.11.2 Discrepancies

Rules that identify discrepancies (i.e. where your project contains data for which the calculation expression returns False) are highlighted in red.

- Click **view** to see the records that fail the test.



- Navigate to the record / form that contains the discrepant value by clicking on the value
- Clicking **exclude** will mark a discrepant value as not to be included as a discrepancy in future executions of this rule

4.11.3 Add a New Rule

Add a new rule by entering a description of the rule and the calculation expression. Then click **Add**.

Add
Enter descriptive name for new rule
(e.g. Participants below age 18)
Enter logic for new rule
(e.g. [age] < 18)
How do I use special functions?

For more information on calculation expressions see Calculated Fields, but remember that data quality rule expressions must evaluate to True or False.

4.12 API

The REDCap API ("Application Programming Interface") is an interface that allows external applications to connect to REDCap. It enables remote retrieval or modification of data or settings within REDCap, such as performing automated data imports into or exports from a specified REDCap project.

The REDCap API help page (click **REDCap API help page**) has more details on the capabilities of the REDCap API and how to use it.

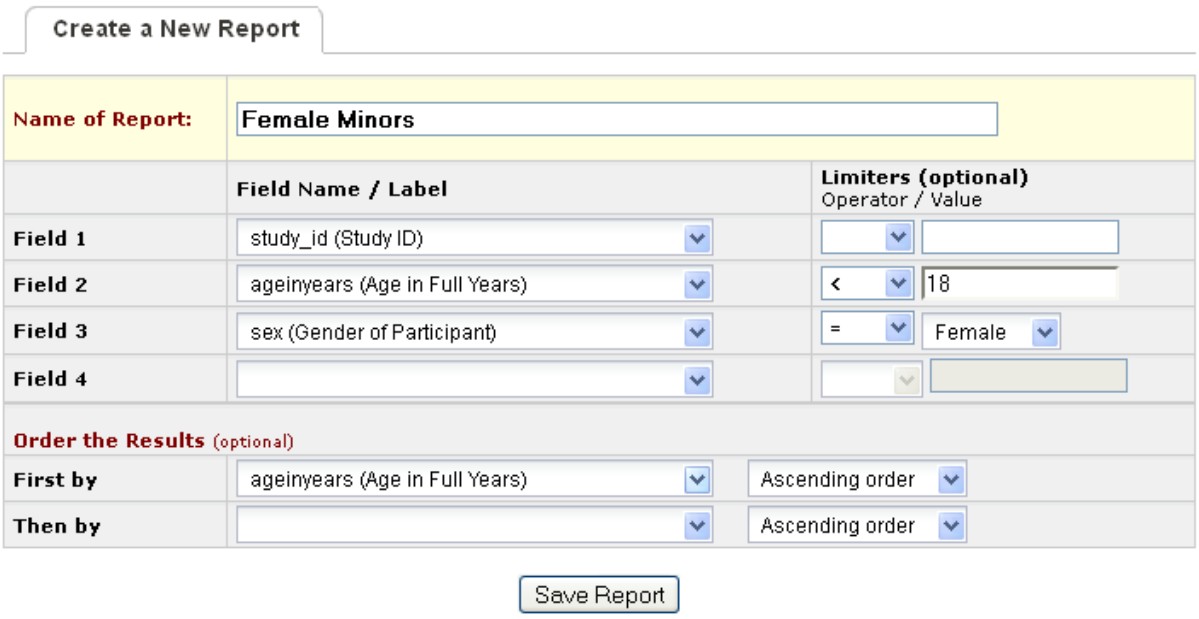
Please contact the REDCap System Administrator for assistance if you believe that you the functionality of the REDCap API might be valuable for your project.

4.13 Report Builder

Use the Report Builder tool to select a subset of fields for which to view and download data in a tabular format. You can also define simple filters to restrict the records that are included in the report. This module is scheduled to be upgraded and merged with the Data Export Tool during 2013.

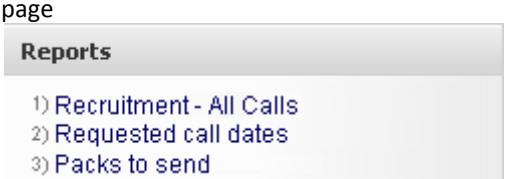
4.13.1 Create a New Report

You create new reports directly on the **Report Builder** page.

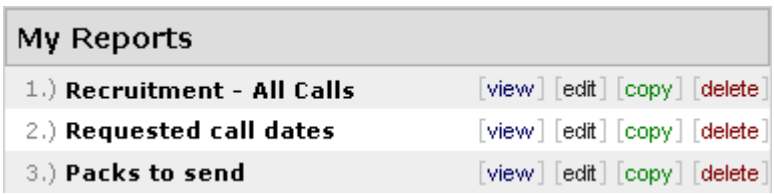


Notes:

- Unfortunately there is no way to re-order fields
- It is not possible to apply more than one limiter to a field (e.g. 5 < age < 7)
- All limiters are applied with AND: it is not possible to have, for example sex = Female OR age < 18
- Reports are listed in their own section of the left-hand menu and are available directly from any project page

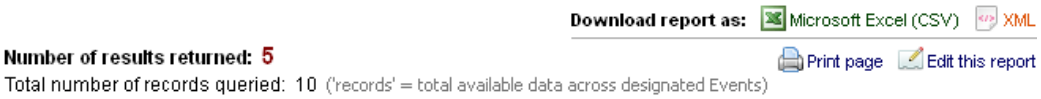


4.13.2 Manage Reports


My Reports
1.) Recruitment - All Calls [view] [edit] [copy] [delete]
2.) Requested call dates [view] [edit] [copy] [delete]
3.) Packs to send [view] [edit] [copy] [delete]

The My Reports table on the Report Builder page provides buttons for report operations:

- **Edit**: the **Edit** view mirrors the report creation view and enables you to amend the fields included in the report
- **Copy**: a new copy is created and shown in the **Edit** view. You must define a new name.
- **Delete**: Delete the report. **Be careful: there is no 'Undo'!**
- **View**: View the report in your browser
  - Download as CSV or XML
  - The record identifier field (if included) functions as a link directly to the record


Download report as: Microsoft Excel (CSV) XML
Number of results returned: 5
Print page Edit this report
Total number of records queried: 10 ('records' = total available data across designated Events)

Q1

Study ID (study_id)	Event Name (redcap_event_name)	Date of Birth (dob)	Disease State (disease_state)	Enrol Date (enrol_date)
1	Enrolment	2001-10-30	bad	2011-12-14
2	Enrolment	1994-09-15	iffy	2011-12-14
3	Enrolment	1995-12-06		2011-12-15
5	Enrolment	2005-03-10	worse	2011-12-14
7	Enrolment	2003-07-25	Mild	2012-02-01

4.13.3 Reports in Longitudinal Projects

The current report builder is very limited when it comes to building report in longitudinal projects. Due to the fact that a field may be associated with multiple events, you get a result row for each record *for each event*, as illustrated below.

Study ID (study_id)	Event Name (redcap_event_name)	Date of Birth (dob)	Enrol Date (enrol_date)	Randomisation Date (randomisation_date)	Second Dose Date (second_dose_date)	Follow Up Date (follow_up_date)
1	Enrolment	2001-10-30	2011-12-14			
1	Randomisation			2012-02-01		
1	Follow Up 1					2012-02-14
1	Follow Up 2					2012-02-19
2	Enrolment	1994-09-15	2011-12-14			
3	Enrolment	1995-12-06	2011-12-15			

It severely restricts the usage of limiters because report records for events not associated with the field will never contain data for the field the limiter is applied to, and will therefore be excluded from the report results.

For example, say we wanted to view date data for project records with a `follow_up_date` > 2012-02-15. We could define our report to show records with `follow_up_date` > 2012-02-15 but then data from Enrolment and Randomisation events would no longer appear in the result set because there can never be a value for `follow_up_date` associated with those events.

The **Report Builder** module is scheduled for a major overhaul, including a merge with functionality currently in the Data Export Tool, during 2013. In the meantime please contact the REDCap System Administrator for information about how a custom reporting plug-in may be able to help you.

5 Project Design

5.1 Form Design Considerations

Listed here are some random thoughts for consideration when designing data collection forms...

Participant-Identifying Data

Think very carefully about exactly what confidential, participant-identifying data is required in your project. It is recommended that identifying information be kept separate from other project data, which can be done – in descending order of security – by:

- Storing offline in encrypted, password protected format
- Creating an entirely separate REDCap project
- Ensuring all identifying fields (see Check For Identifiers) are on separate forms to other data, and that access to these forms is restricted to the minimum set of users

Yes/No and True/False Field Type

Use of REDCap's **yes/no and true/false field types** is not recommended. Use a radio group or drop-down list instead so that values and value labels are completely transparent to anyone that looks at your project.

You will also maintain the flexibility to add new values, such as missing and query codes and alter labelling later, if required (e.g. "yes" -> "Yes, give details").

Drop-down list or radio group?

Resolving this question comes down partly to personal preference, but consider also who and how the data entry forms are used. As a suggestion:

- Radio groups are best for survey forms, or on data entry forms for infrequent data entry users, because all potential choices are displayed on the form
- Drop-down lists are preferred for data entry forms because you can tab to/through fields and select options using keyboard input (e.g. y/n if your labels are "Yes" / "No") or numeric keypad (e.g. 1/0 if your labels are "1 Yes" / "0 No")

There can also be an argument for using radio buttons where data entry users are inexperienced (i.e. mouse-heavy): selecting an option from a radio group is one click with a mouse, rather than the three clicks (or press-select-release) for a drop-down list. But experienced computer / data entry users are likely to prefer the mouse-free usage afforded by drop-down lists.

Section Sub-Headings

REDCap's Descriptive Text fields can be used as sub-headings. This is particularly of use in surveys that are set to use section headings as page breaks.

Missing Values and Query Codes

When data is entered into REDCap from a paper data source (e.g. CRF) it is essential that the data entry person has the ability to record when data is missing (where it should not be) or indicate that there is some query about the data to be entered (perhaps what is written on the paper is indecipherable, for example). This requires that ALL fields on your form have scope for the entry of appropriate missing and query codes. See Handling Missing Values for suggestions on how to do this.

5.2 Testing

The purpose of a database - and the function of database software - is to provide your data with structure and integrity that cannot be enforced using unstructured formats such as text files or spreadsheets.

The purpose of testing your database is to ensure that it has the structure and integrity checks that you expect and that it meets your requirements.

5.2.1 General instructions

- Testing a database means doing much more than simply verifying that it contains the desired fields: you need to verify that each field has the appropriate properties (data type, allowed range, allowed values) and that cross-field data validations act as you expect.

- Try to "catch out" the database. Verify that the database not only does everything that you expect it to do, but also that it does not do things that you expect it *not* to do.

5.2.2 Specific instructions

- For continuous fields, such as dates and numbers, that have range validations, test around the boundaries by entering the minimum and maximum values (which should succeed) and then entering values just outside the valid range (which should trigger warnings). For example, if height should be 50 - 250 cm: ensure that 50 and 250 are accepted, and that 49 and 251 trigger a warning message.

- Test that your branching logic is working properly, skipping questions on pregnancy for male participants, for example.

- Check that required fields are marked as such. REDCap does permit you to leave required fields blank, but will warn you when you try to save the record.

5.2.3 Testing Changes to Projects in Production

When your project is in production changes to your data entry forms are made in Draft Mode. See Making Changes to a Production Project for more information.

When making changes in draft mode, the current versions of your data collection forms remain active in the system. This is a problem if you are making any non-trivial alteration because you are unable to test the draft changes to ensure that it functions as you expect.

You have two options to work around this issue:

1. Create a practice project and set it up with the new fields you require along with any dependencies. This method is particularly suited to testing calculation and branching logic expressions.

2. Create a copy of the project, including an import of the current data. Make the changes in this copy and test thoroughly with the real data. Depending on the type and extent of the changes it may even be more practical to move the copied project into production (with refreshed live data) and archive the original, now out-of-date project.

   This method is particularly suited to changes implementing new forms and/or event schedules.

5.3 Handling Missing Values

There is no standard approach to missing value handling in REDCap data entry forms, but that does not mean that it cannot be dome. Project designers must consider their project's requirements and define a convention that their data entry staff can apply.

5.3.1 Suggested Approach for Handling of Missing Data

REDCap does not contain specific functionality for missing value handling, such as EpiData's ability to define a valid range, plus certain specific values as valid entries in a field. REDCap's validation checks, however, are "soft" checks. As such, a warning is generated for out-of-range values, but the form can still be saved.

This means that it is possible to define a convention for missing value and query codes that can be adhered to throughout the project. Ensuring that the convention is specified in field notes will assist compliance.

Ask the REDCap System Administrator about a custom report that can display all fields that contain missing or query codes.

Summary

- Define codes to be used for missing values and queries throughout your project, for example -1=missing, -2=query.
- These codes can be used in numeric (integer or number) fields event if a valid range is specified. In that case, out-of-range warnings will be generated, but data entry personnel will know to expect them and can cancel the warning and proceed.
- Such numeric codes can be used in text and notes fields equally well as in numeric fields
- Date and datetime fields require valid dates / date times: 9999-09-09=missing, 8888-08-08=query, for example
- The missing and query codes should be included as valid responses in all categorical fields: "0, No | 1, Yes | -1, Missing | -2, Query", for example.
- Checkbox groups provide more of a challenge as each individual check box is, by nature, a binary response: it is not possible to include extra options to "ticked"/"unticked". A suggested work-around is to add an additional field for "check box group data present?" with a "1, Valid | -1, Missing | -2, Query" response. Branching logic can be used to hide the check box group unless the response is 1.

  Note that sometimes there is simply no distinction between a check box group with missing data and a check box group where none of the options correspond to a desired response.
- Use the Field Note option to add reminders of the missing and query codes to the data entry forms. Doing that is a straightforward copy-and-paste job in the data dictionary.
- Contact the administrator to include a Missing and Query Codes custom report in your project.

5.4 Calculated Fields

5.4.1 What Calculated Fields Are – and Are Not – For

REDCap's calculated fields are useful in certain situations, but they are not a replacement for your stats package when it comes to generating robust and precise figures for the analysis purposes.

Calculations can be necessary for the following two cases:

- Where the calculation result – perhaps in conjunction with branching logic – affects the data entry workflow
- Where the calculation result is required in a report filter expression

In other instances, calculations are best performed in a statistical analysis package after it has been exported from REDCap.

Every calculated field is shown with a disclaimer that reiterates this point.

5.4.2 Calculation Expressions

Currently the best source of help for formulating calculation expressions can be found on REDCap's **Help & FAQs** page: https://redcap.mcri.edu.au/index.php?action=help#CalculatedFields. It describes:

- Basic formatting (i.e. enclose field names in square brackets:`[systolic_bp]`)
- Some simple examples, e.g. (being careful with the units!)
  BMI = `[weight_kg]`*10000/(`[height_cm]`*`[height_cm]`)
- Cross-form and cross-event usage
- Date and datetime calculations
- Available functions
- Conditional logic

Calculation results must be numeric, not text, boolean or date

5.5 Branching Logic

Currently the best source of help for formulating calculation expressions can be found on REDCap's **Help & FAQs** page: https://redcap.mcri.edu.au/index.php?action=help#BranchingLogic. It describes:

- Basic formatting of branching expressions (i.e. enclose field names in square brackets and choice field values in single or double quotes: e.g. `[gender]` = '1')
- Branching logic for checkbox values
- Branching logic for cross-event and cross-form field values

Example usage for validation

5.6 Styling with HTML and CSS

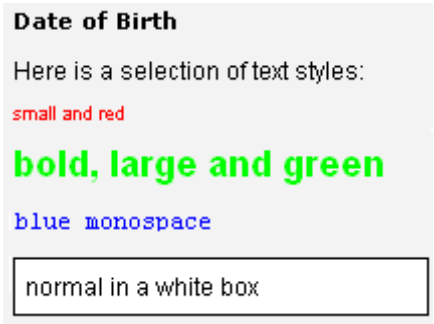
Additional styling can be added to certain elements in your project using HTML tags with CSS styles. Examples include:

- Field labels
- Section headings and descriptive text fields
- Survey welcome and thank-you messages
- Survey invitation emails

This guide will not become a web programming manual: you can find good references for HTML and CSS at w3schools.com, and Google is forever your friend. Nevertheless, some examples of the types of formatting that can be applied are included below. First a section header, then two field labels:

```
Demographics Information<br />
<div style="width:100%; color:#FFF; background-color:#F00;
padding:5px; position:relative; top:-5px; left:-
5px;">Confidential</div>
```

```
<div class="green notranslate">Full Name</div>
```




```
Date of Birth

<p style="font-weight:normal;">Here is a selection of text
styles:</p>

<p style="color:#F00; font-size:75%;">small and red<p>

<p style="color:#0F0; font-weight:bold; font-size:150%;">bold,
large and green</p>

<p style="color:#00F; font-family: monospace;">blue
monospace</p>

<p style="display:block; padding:5px; border:1px #000 solid;
background-color:#FFF; ">normal in a white box</p>
```

6 Further Considerations

6.1 Data Model

The REDCap application database is a relational database with the application domain modelled with linked tables in a conventional normalised form that will be familiar to anyone that has used Microsoft Access.

REDCap project record data, however, is stored in a single table using what is known as an entity-attribute-value model (EAV):

- **Entity**
  The item being described: for REDCap this is a combination of the record identifier and the event identifier

- **Attribute**
  Attributes are properties of the entities. REDCap form fields can contain data relating to a specific project record/event entity, thus each field name is an attribute of the record/event entity.

  Attributes may also have metadata. REDCap has a 'metadata' table that contains information on other characteristics of each attribute (i.e. form field) such as the data type, label validation type etc.

- **Value**
  Each attribute may have (at most) a single value. In REDCap the value corresponding to an attribute is simply a data point saved in a field.

  All values are stored as text. Data type information is stored as metadata of each attribute. REDCap uses this metadata to determine how values need to be rendered and validated.

The illustration shows a few records of dummy data from the REDCap data table.

project_id	event_id	record	field_name	value
9	32	1	study_id	1
9	32	1	first_name	sdfsdf
9	32	1	last_name	sdfbsdbs
9	32	1	pain	2
9	32	1	demographics_and_stuff_complete	2
12	35	123	dob	2010-09-01
12	35	123	enrolment_date	2010-09-03
12	35	123	days_since_birth	2

The structure of this table helps to illustrate the points made under Data Export: Data Model for Longitudinal Projects and Reports in Longitudinal Projects as you can see that you need the combination of project_id, event_id, record and field_name to specify a unique data point.

See http://en.wikipedia.org/wiki/Entity%E2%80%93attribute%E2%80%93value_model for a more in depth discussion of the EAV model.

6.2 Use Cases

6.2.1 Modelling 1:n Relationships for Small n: Wide Dataset

Contact the REDCap System Administrator for more information.

6.2.2 Modelling 1:n Relationships for Large n: Linked Projects

Contact the REDCap System Administrator for more information.

6.2.3 Data Query Tracking

Contact the REDCap System Administrator for more information.

6.2.4 Operational Support: Tracking Project Milestones

Contact the REDCap System Administrator for more information.

6.2.5 Multi-Arm Setup for Enrolment and Randomised Phases

Contact the REDCap System Administrator for more information.

6.2.6 Contact Details/Project Enquiry Form Embedded in Webpage

Contact the REDCap System Administrator for more information.

6.3 Advanced Features

REDCap contains additional advanced features that are not covered elsewhere in this guide:

- **Plugin architecture** that enables development of customised functionality
  - Custom Reports: define custom reports with SQL that can be viewed and downloaded
  - Record View: a cross-event, cross-form view of field data for a single record
- **Data Transfer Services**
- **Randomisation**
- **Dynamic drop-down list options using SQL**

Contact the REDCap System Administrator if you are interested in learning more about these features.

6.4 Alternatives to REDCap

Listed in the table are some commonly used alternatives to REDCap, along with some pros and cons.

REDCap Alternative	Why use the alternative	Why use REDCap?
EpiData	• Simple, quick, uncluttered data entry • Excellent field validation features	• Audit trail of data changes • Permission controls • Accessibility of web-app • Better multi-form capabilities • No file version management or backup headaches
Microsoft Access / FileMaker Pro	• Infinite scope for customising forms, reports and relationships to project's exact requirements • Mail merge • Send email notifications (Access with Outlook)	• Audit trail of data changes • Permission controls • Accessibility of web-app • Much simpler and less error-prone project design with no programming knowledge required • No file version management or backup headaches
Survey Monkey	• Some additional form design flexibility • Close survey after target number of responses	• Data hosted at MCRI: suitable for confidential data • Free to MCRI users • Participant list enables individual participant URLs • Track individual responses • Better export options
CTMS / EDC (E.g. WebSpirit)	• Compliance with regulatory regimes such as FDA's 21 CFR part 11 • Integrated data query work flow functionality • Project- and site-level data and reporting	• Simpler, quicker project design • Online survey functionality • Upload/integration functionality

You are free to use the tools that best suit your needs. The important things is to put some thought into what will be best as early in the project as possible.

CEBU's Data Management web pages (https://www.mcri.edu.au/research/core-facilities/clinical-epidemiology-biostatistics/data-management/) has a Project Data Management Plan document template that can function as a checklist of data management issues to consider, of which the selection of appropriate database software is but one.

6.5 More Help

6.5.1 This Guide

The author welcomes any and all queries, comments and suggestions regarding the content and presentation of this user guide. Criticisms should be sent to noreply.redcapguide@mcri.edu.au.

Document History

Document	Date	Author	REDCap Version
REDCap_User_Guide_3.00_2013-04-10.docx	10-Apr-2013	Luke Stevens	5.2
REDCap_User_Guide_2.00_2012-08-07.docx	07-Aug-2012	Luke Stevens	4.13
REDCap_User_Guide_1.00_2012-07-04.docx	04-Jul-2012	Luke Stevens	4.9

6.5.2 REDCap System Administrator

For more information about accessing REDCap, or for help and advice on REDCap usage, contact the REDCap administrator.

Luke Stevens
Data Management Coordinator
Clinical Epidemiology and Biostatistics Unit (CEBU)

Murdoch Childrens Research Institute
The Royal Children's Hospital
Flemington Road Parkville Victoria 3052 Australia
T +61 (0)3 9345 6552
F +61 (0)3 9345 6000
E luke.stevens@mcri.edu.au
W http://www.rch.org.au/dmo/ | http://intranet.mcri.edu.au/?page_id=11954

6.5.3 Training

An introductory training course has been developed. Information on dates, availability and cost is available from CEBU: https://www.mcri.edu.au/research/core-facilities/clinical-epidemiology-biostatistics